CORHOLE SG-1

THIS ENVELOPE CONTAINS THE FOLLOWING GEOPHYSICAL LOGS:

1. Schlumberger Sonic
2. Schlumberger Borehole Compensated Sonic
3. Schlumberger Laterolog

II B-2205

SHOUT
SHARE
IT

TN
859
.C64
C3755
no 2
v.7

U.S. DEPARTMENT OF THE INTERIOR

PROTOTYPE OIL SHALE LEASING PROGRAM

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TRACT C-b

QUARTERLY REPORT #2

(Through February 28, 1975)

Submitted to:

Mr. Peter A. Rutledge
Area Oil Shale Supervisor
Conservation District
U. S. Geological Survey
Grand Junction, Colorado

By:

Ashland Oil, Inc.
Atlantic Richfield Company, Operator
Shell Oil Company
The Oil Shale Corporation

APRIL 14, 1975

QUARTERLY REPORT #2

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II B-10 Lithologic Logs

The lithologic logs present a description of rock types encountered in a core hole. The detail of description varies with depth and operation. In most cases, however, the lithology is described from drill cuttings on ten-foot intervals above the "A" groove. In the lower zones, the lithology is described from cores on one-foot intervals.

In addition to providing a means for describing lithology, the litholog presents data such as information on structural dip, joints, fractures, and general rock quality data. These data are entered in the lithologic log at the appropriate depth.

A field lithologic log has been made on each well drilled. Table II B-10.1 shows those wells for which a lithologic log is included in either the First or the Second Quarterly Report.

SENSITIVE MATERIAL

LOGS AVAILABLE ONLY BY PERMISSION OF AOSS

LITHOLOGIC LOGS

ALLUVIAL WELLS		AQUIFER TEST WELLS		CORE HOLES	
A-1	1	AT-1	1	SG-1	1
A-2	1	AT-1a	1	SG-1a	2
A-3	1	AT-1a1	1	SG-6	1
A-4	1	AT-1b	1	SG-8	1
A-5	1	AT-1c	1	SG-9	1
A-6	1	AT-1d	1	SG-10	1
A-7	2			SG-10a	1
A-8	1			SG-11	1
A-9	1			SG-17	2
A-10	1			SG-18	1
A-11	1			SG-18a	1
A-12	1			SG-19	1
A-13	1			SG-20	2
				SG-21	2
				Cb-2b	1

1, 2 = Indicates Quarterly Report in which litholog is log included.

TABLE II B-11.1

GEOPHYSICAL LOGS INCLUDED IN QUARTERLY REPORT #2

Well	SG-1	SG-1a	SG-8	SG-9	SG-17	SG-20	SG-21
Log (Schlumberger)							
Sonic	X		X				
Sonic, Bore hole Compensated	X		X	X	X	X	X
Laterolog	X		X	X			
Dual Laterolog	X				X		X
Formation Density	X	X	X	X	X	X	X
Temperature	X		X	X	X	X	X

SG-1

Schlumberger

LATEROLOG

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #1
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #1

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION: API Serial No.
1946' FEL & 1314' FSL
Sec. 2 Twp. 3S Rge. 97W

Other Services:
FDC-GR
BHC-GR
HRT
AMP-VDL-GR

Permanent Datum: GL, Elev. 6428
Log Measured From GL 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. 6436.5
D.F. 6435.5
G.L. 6428

Date	12-7-74			
Run No.	ONE			
Depth—Driller	2525			
Depth—Logger	2522			
Btm. Log Interval	2518			
Top Log Interval	154			
Casing—Driller	8 5/8 @ 156	@	@	@
Casing—Logger	154			
Bit Size	6-3/4			
Type Fluid in Hole	WATER			
Dens. | Visc.	8.0 | -			
pH | Fluid Loss	N.A. ml	ml	ml	ml
Source of Sample	MUDPIT			
R_m @ Meas. Temp.	3.9 @ 64 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
Source: R_{mf} R_{mc}	-			
R_m @ BHT	2.2 @ 119°F	@ °F	@ °F	@ °F
Time Since Circ.	11 HOURS			
Max. Rec. Temp.	119 °F	°F	°F	°F
Equip. | Location	7683 | 4116			
Recorded By	YATCHAK/ETTER			
Witnessed By	BURNS			

SWS 1974-C

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.		
Depth - Driller		
Type Fluid in Hole		
Dens. | Visc.		
ph | Fluid Loss	ml	ml
Source of Sample		
R_m @ Meas. Temp.	@ °F	@ °F
R_{mf} @ Meas. Temp.	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F
Source: R_{mf} | R_{mc}		
R_m @ BHT	@ °F	@ °F
R_{mf} @ BHT	@ °F	@ °F
R_{mc} @ BHT	@ °F	@ °F

REMARKS

Service Order No. - 6929
THE LOG IS SATURATING IN HIGHLY RESISTIVE ZONES
FROM 10,000 TO 30,000 OHMS.

SP TRACED FROM "NO POWER" RUN

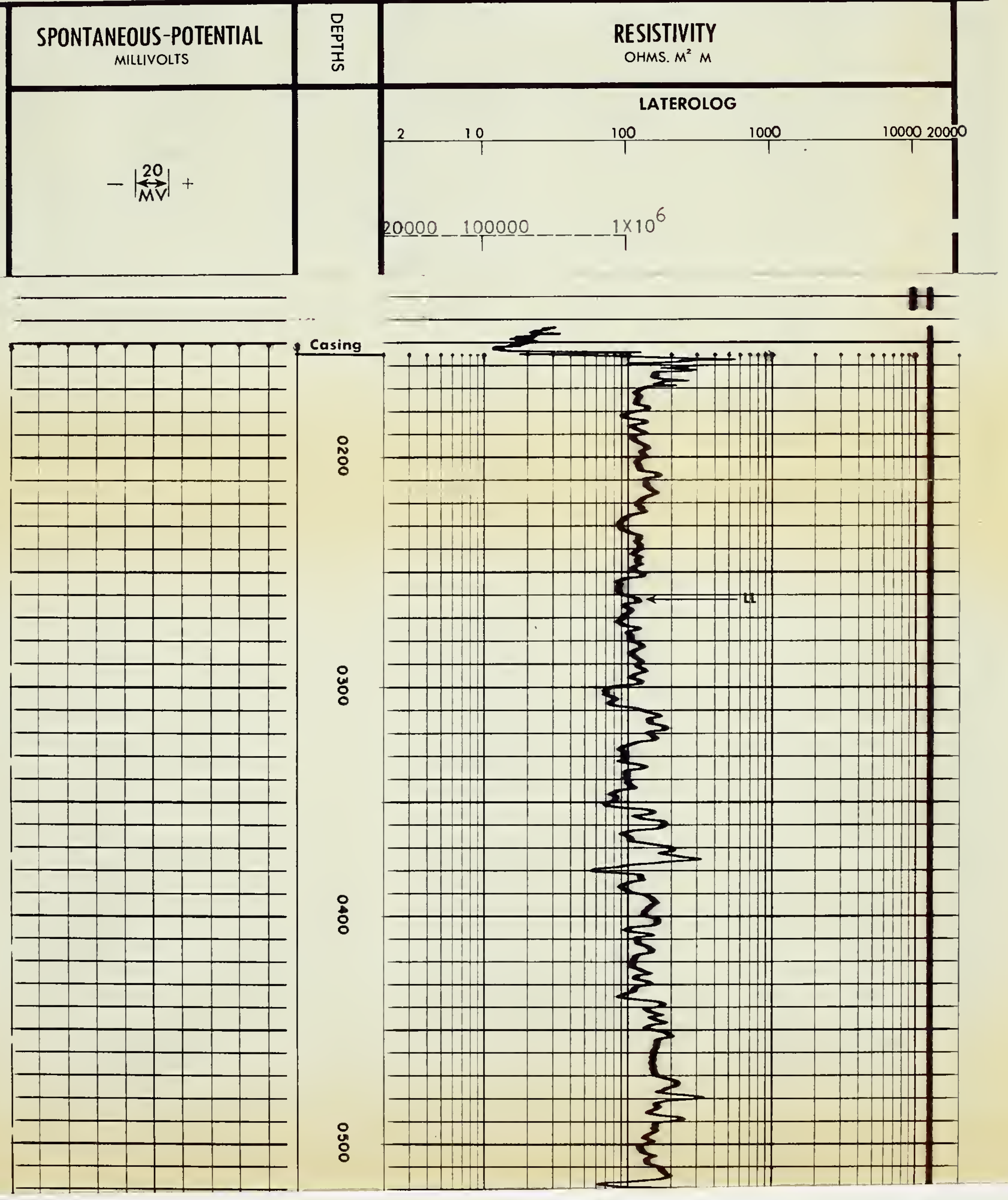
EQUIPMENT DATA

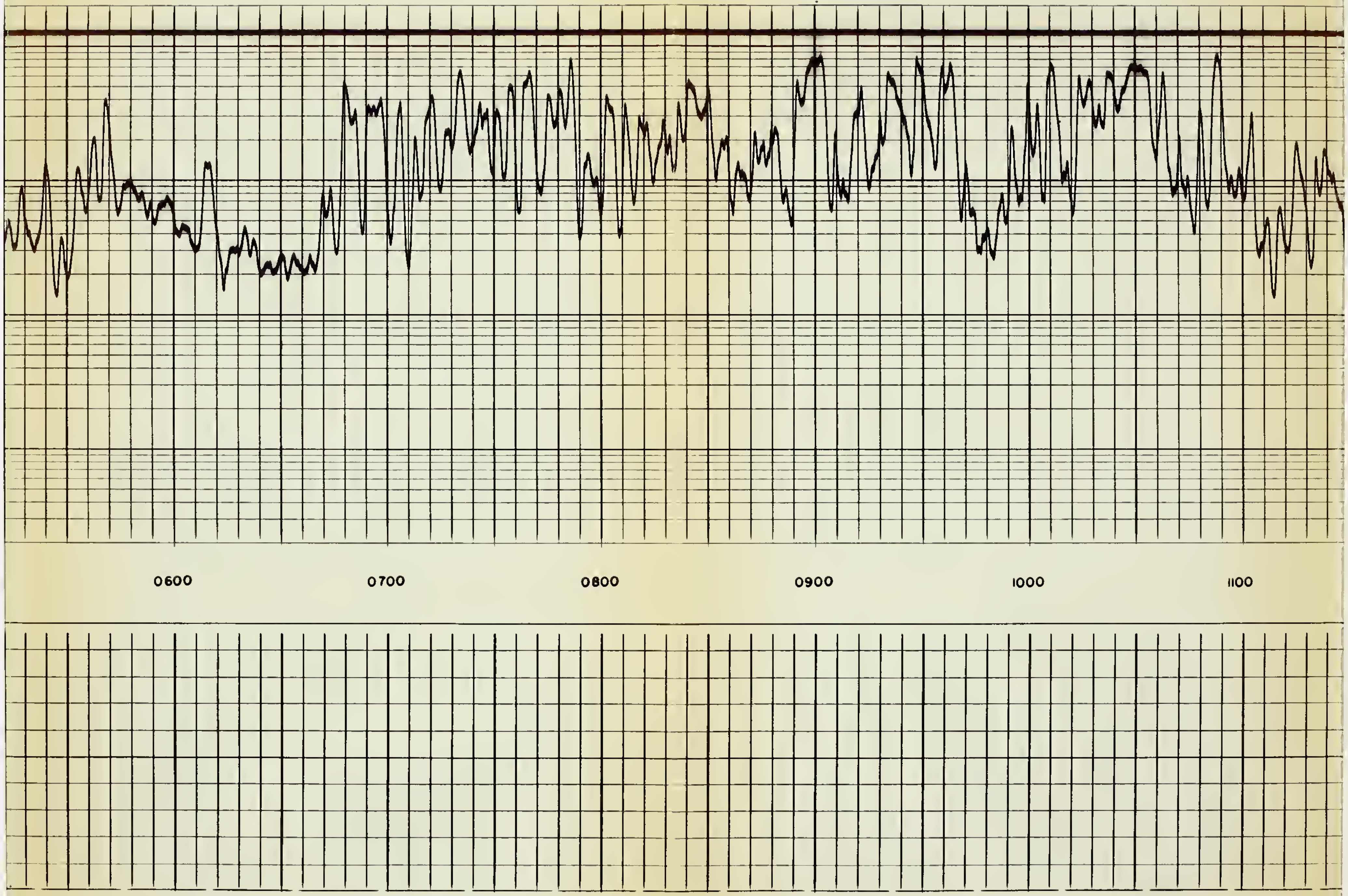
Run No.	ONE
Panel No.	790E
Cart. No.	798
Sonde No.	798
Mem. Panel No.	-
G.R. Cart. No.	-
G.R. Panel No.	-
TTR No.	-
Speed-F.P.M.	60

CALIBRATION DATA

CALIBRATION	BACKGND. CPS.	SOURCE CPS.	GALV. INCR. DIVISION	SENS. TAP (FOR CAL.)	SENS. TAP (RECORD)	TIME CONST.
GAMMA RAY						

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

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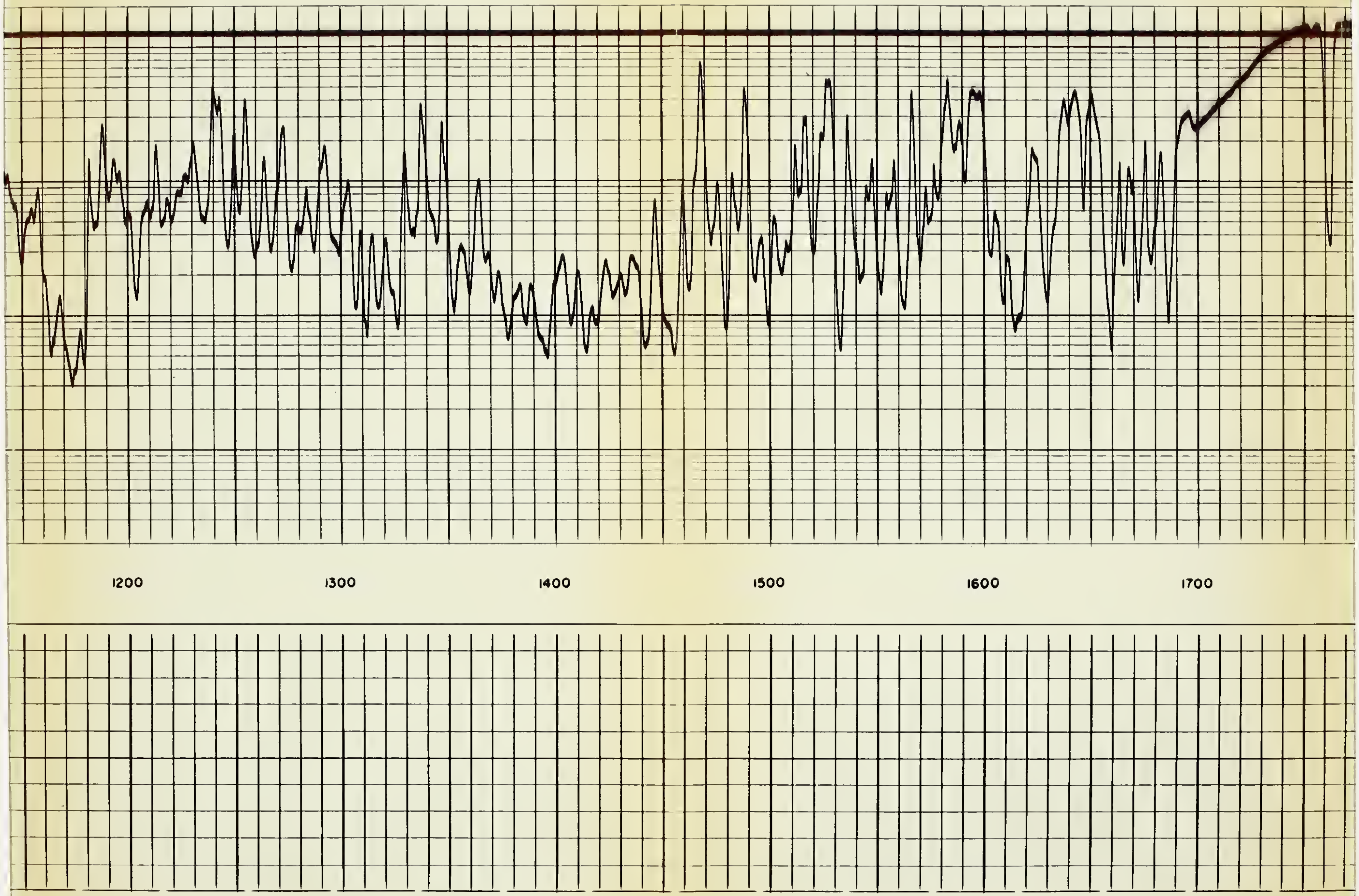
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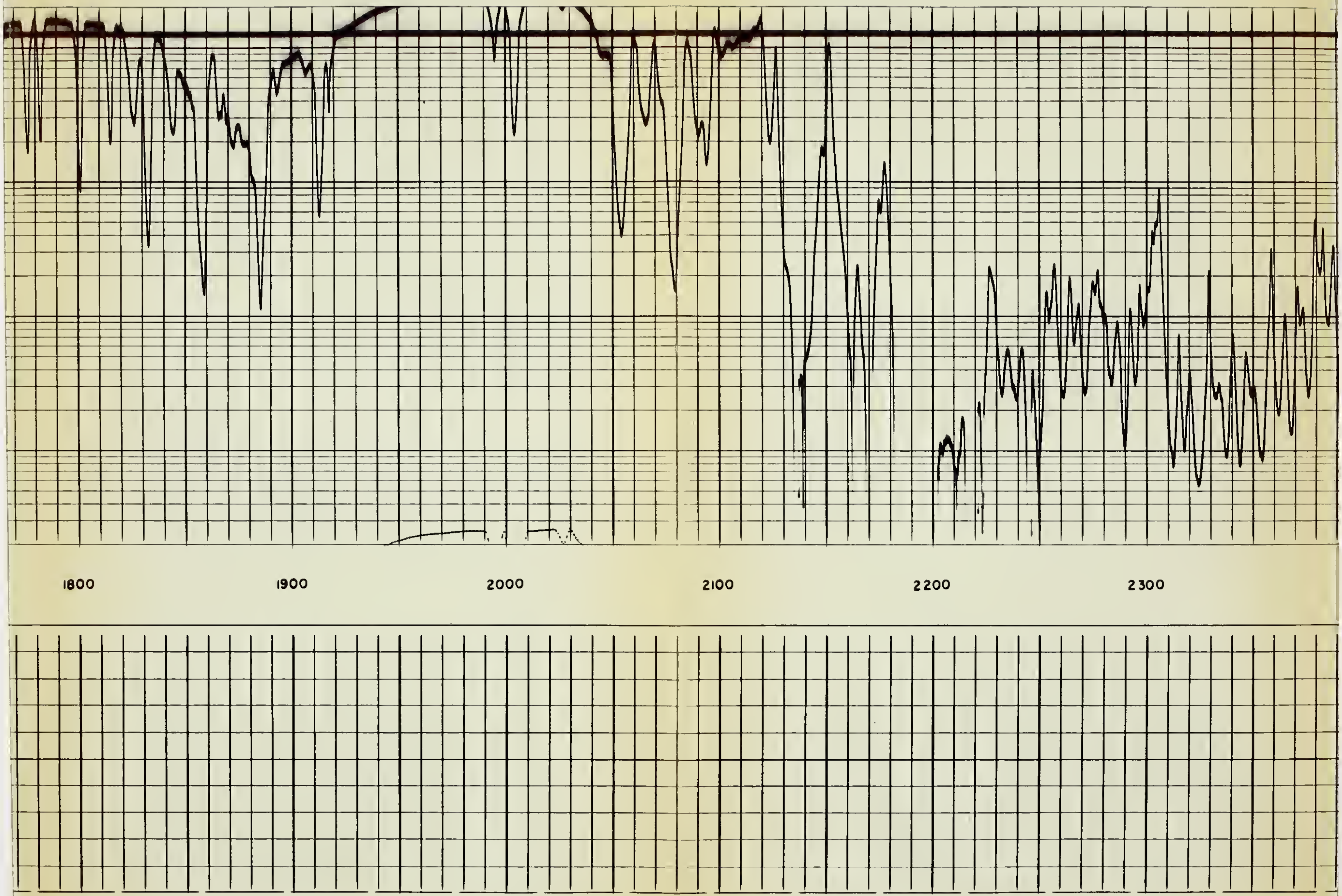
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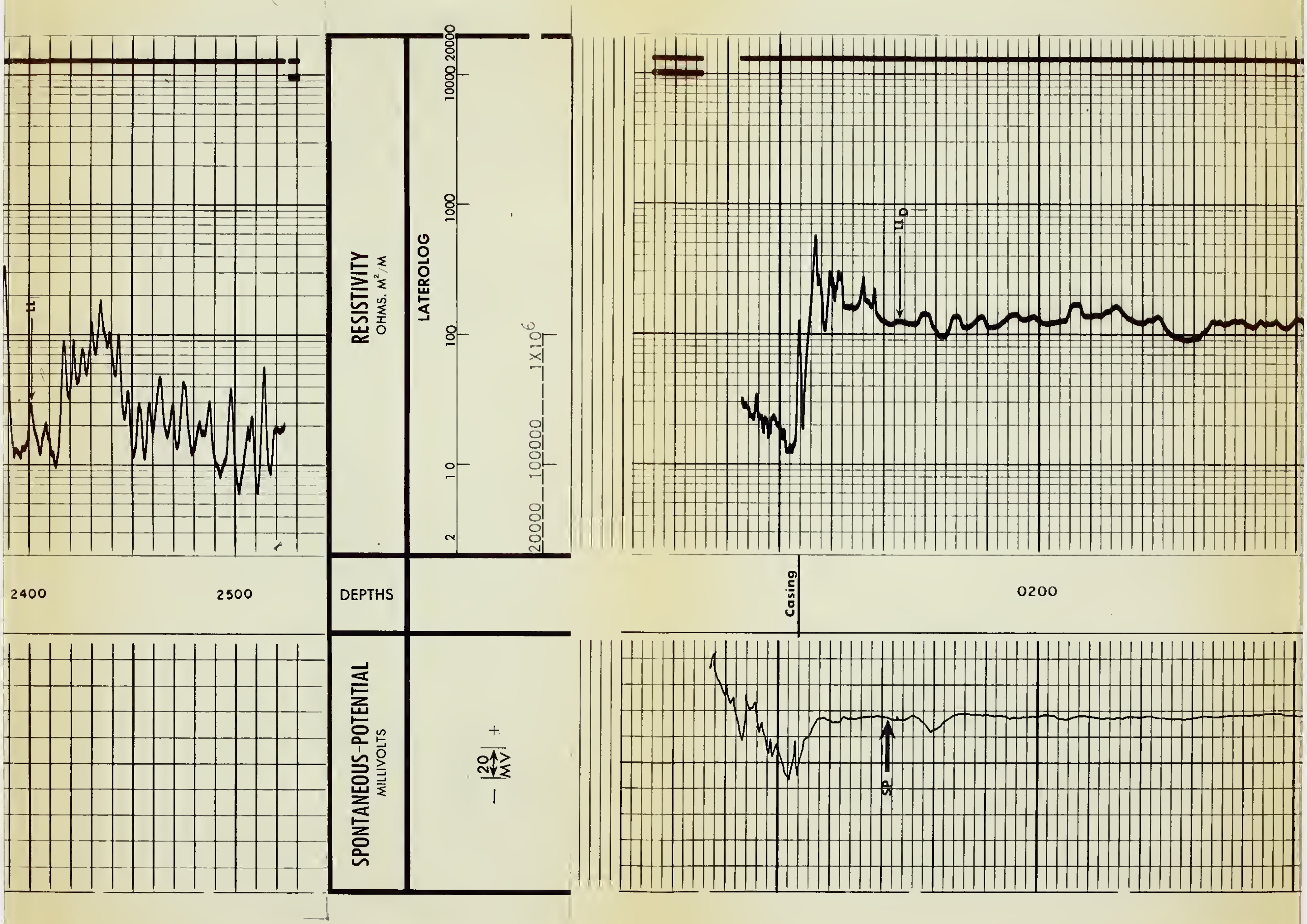
RESISTIVITY
OHMS. M²/M
LATEROLOG
20000
10000
1000
100
10
2
1X10⁶
100000
20000
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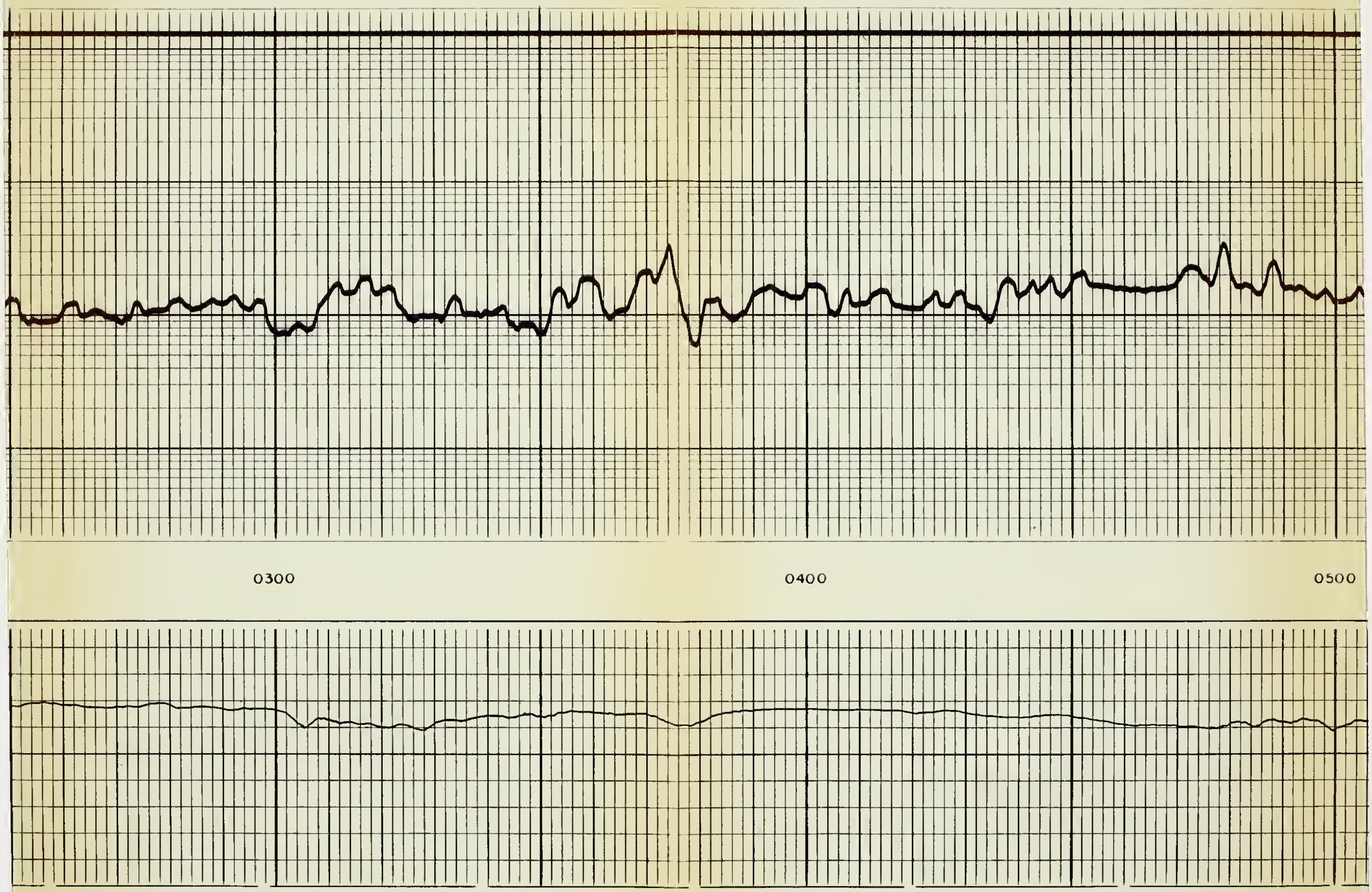
LLD
DEPTHS
2400
2500
Casing
0200
SPONTANEOUS-POTENTIAL
MILLIVOLTS
− 20 MV +
SP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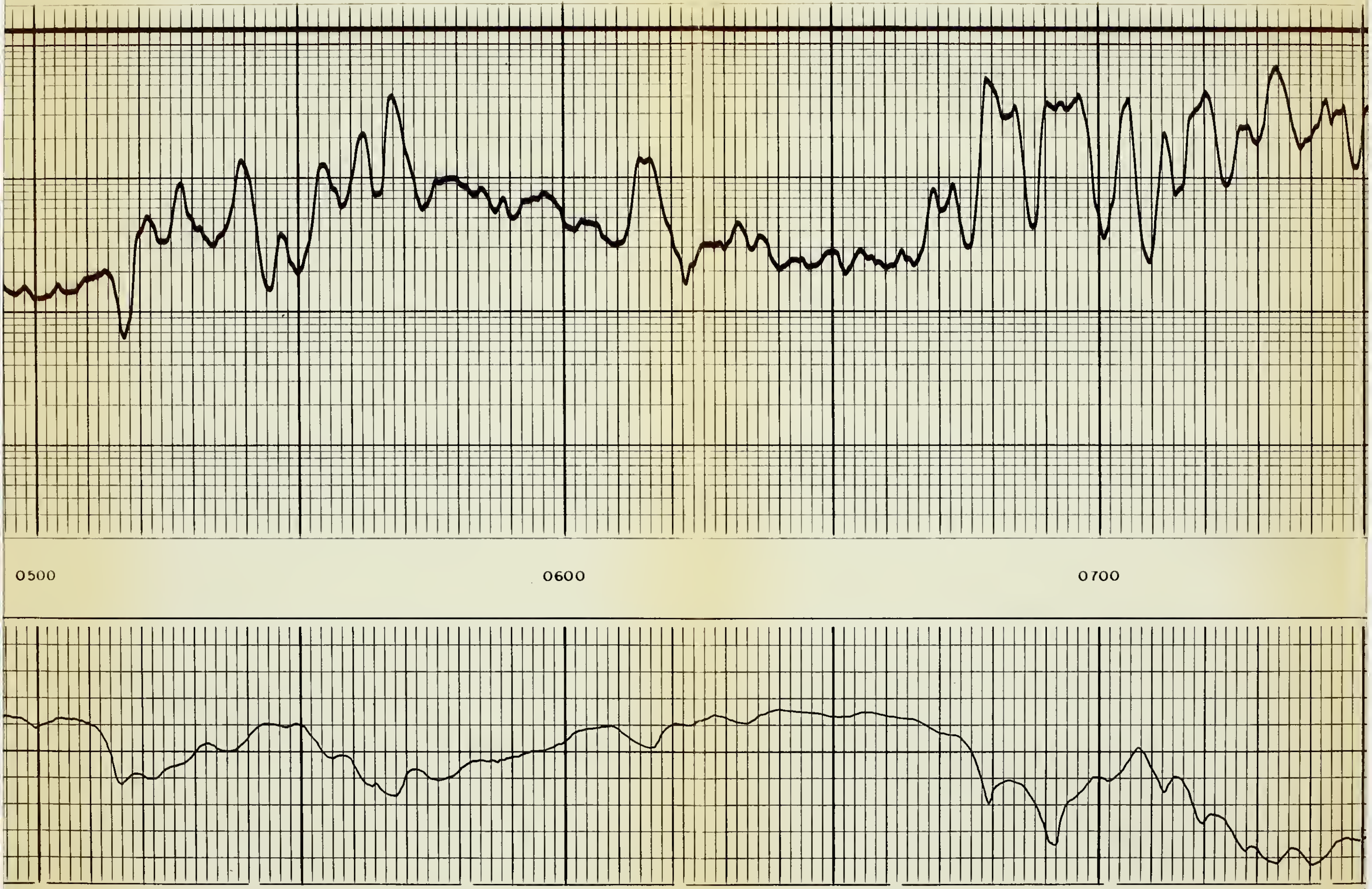
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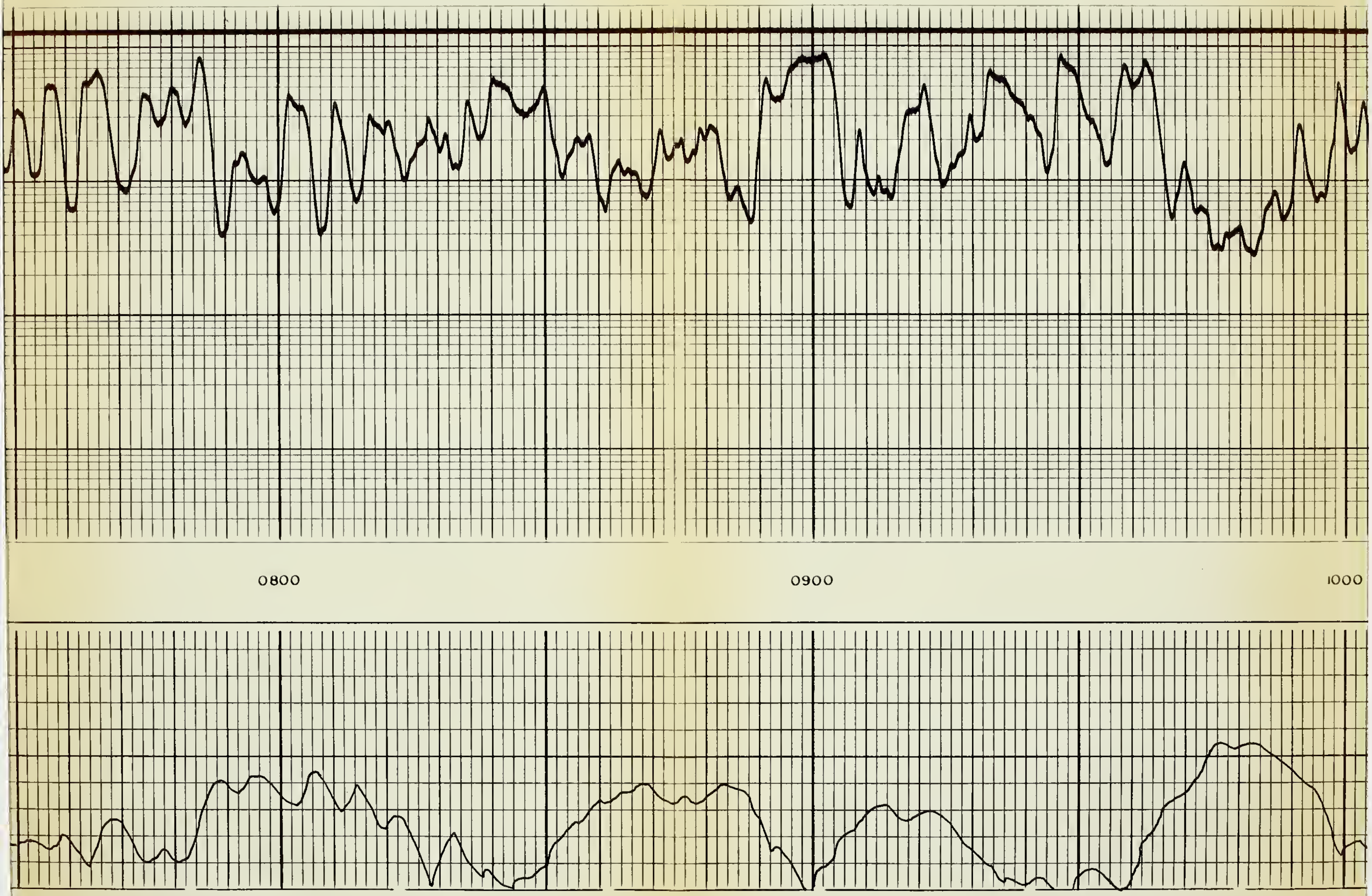
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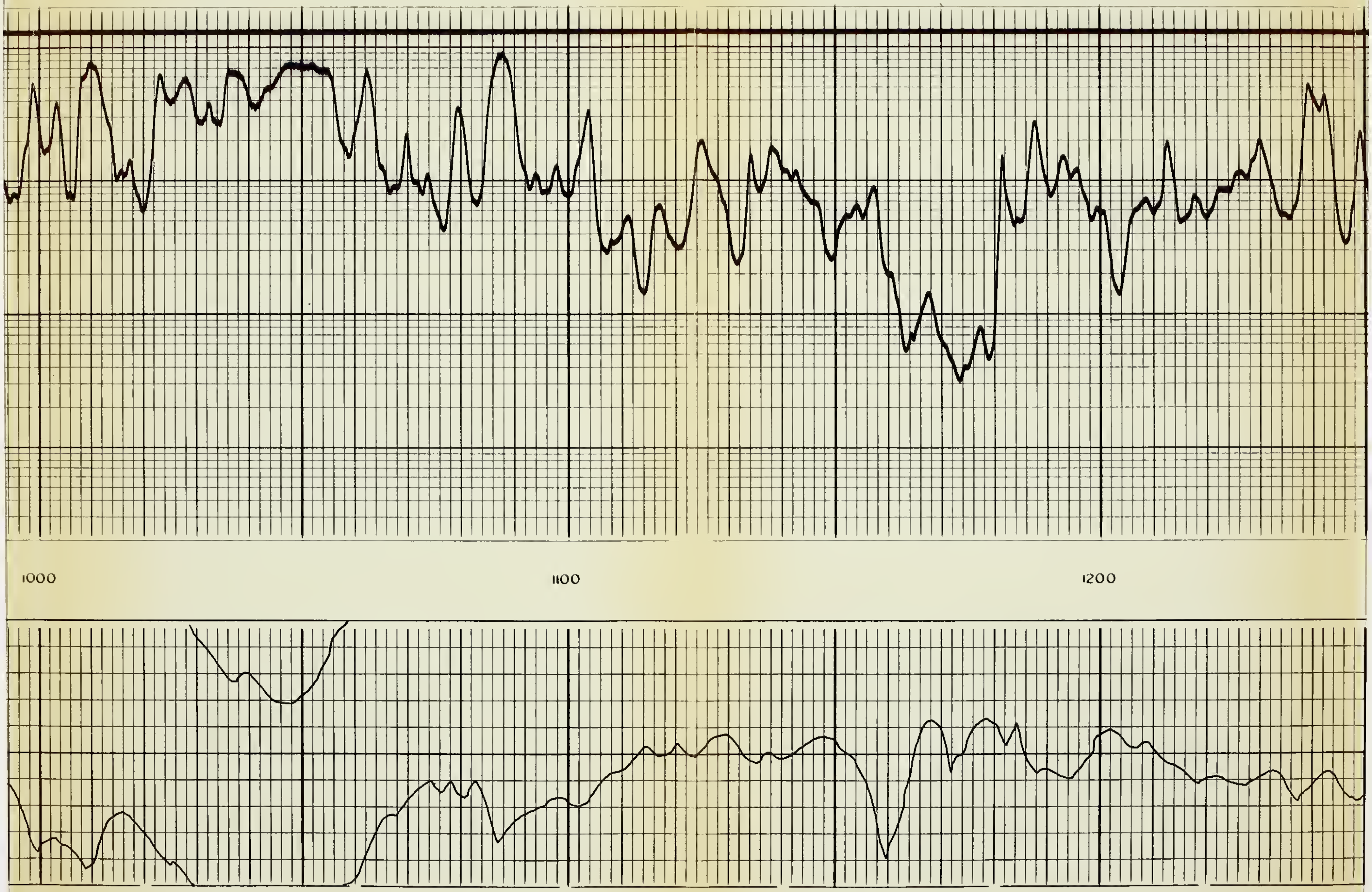
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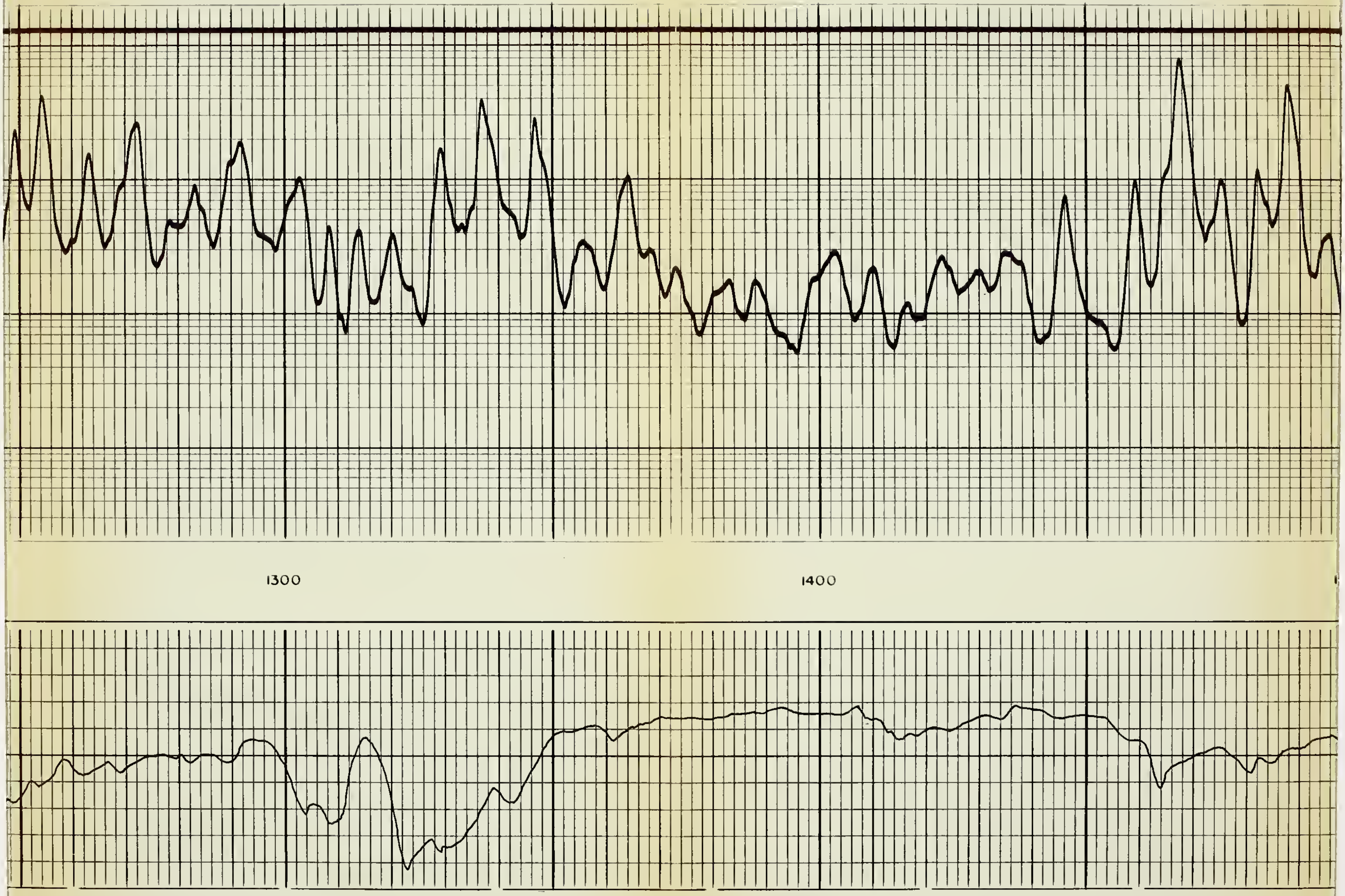
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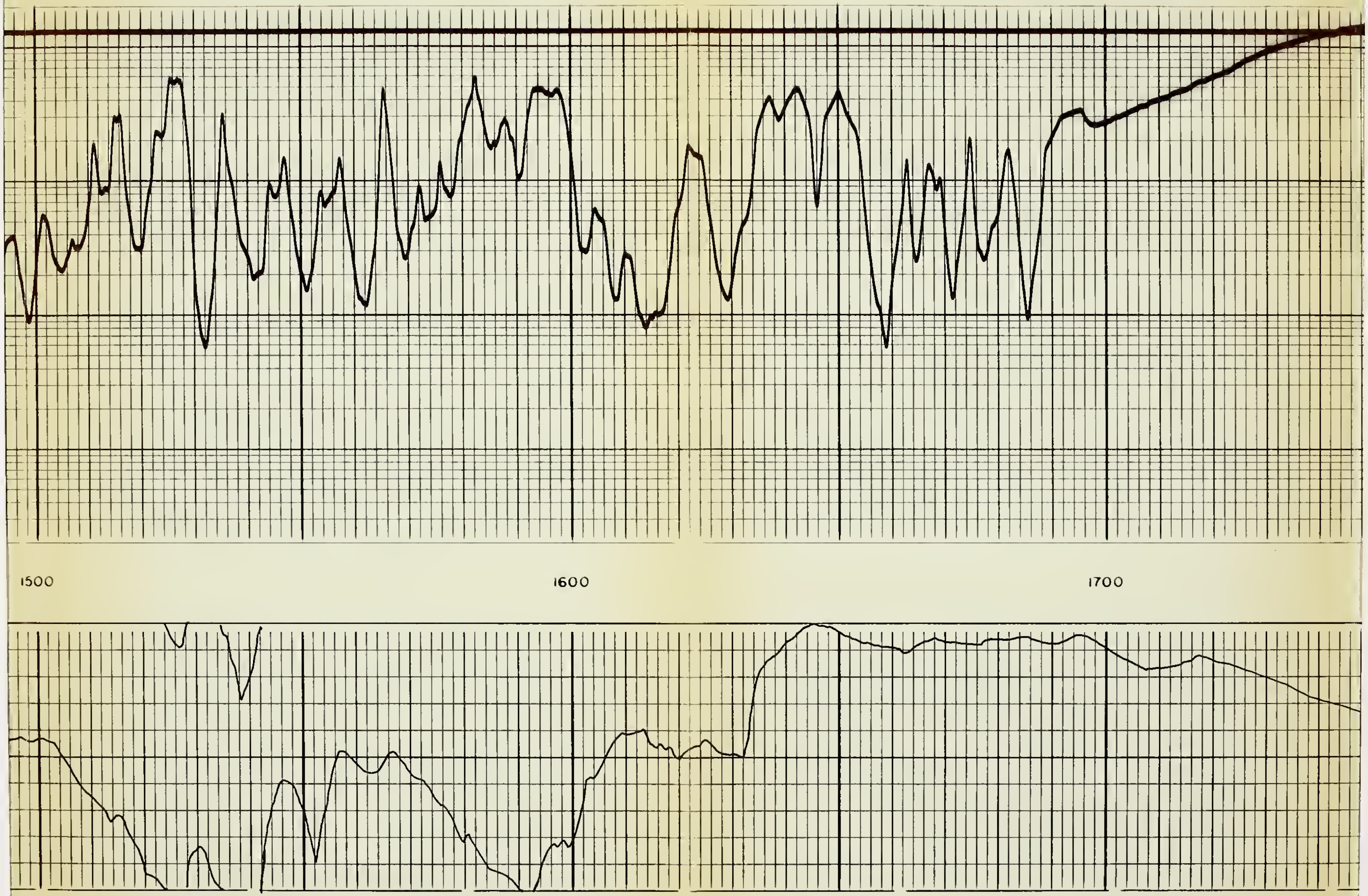
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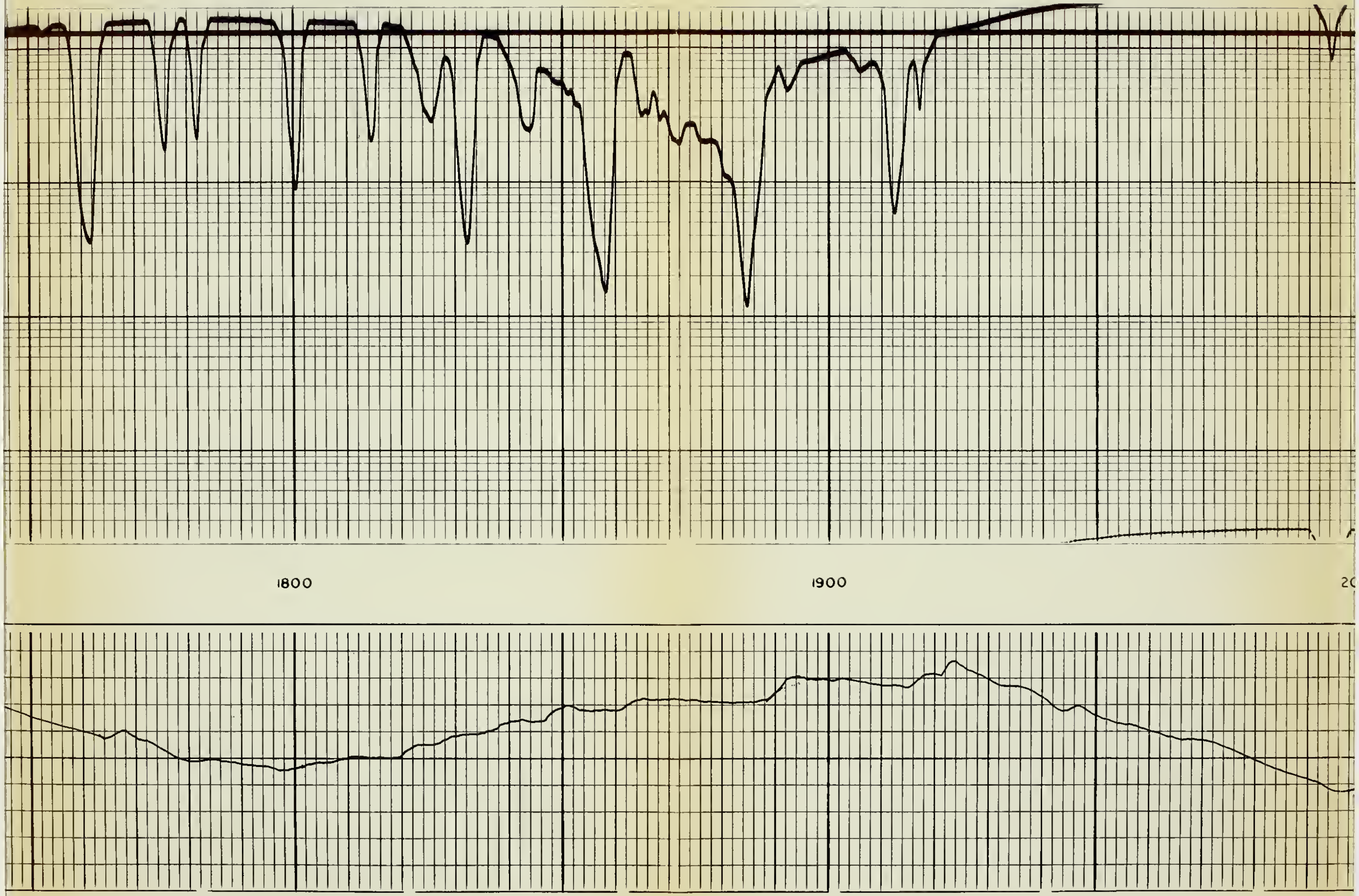
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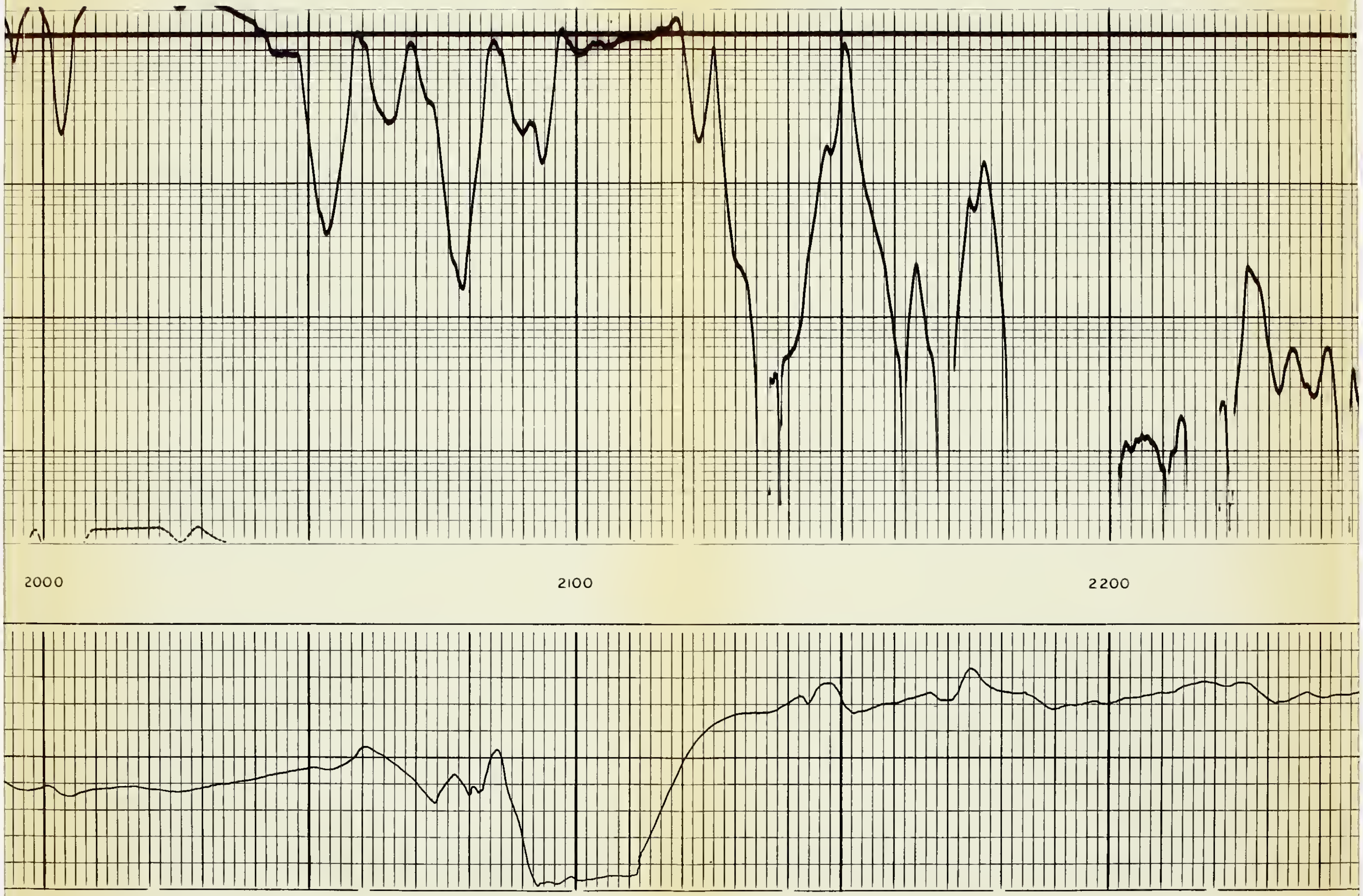
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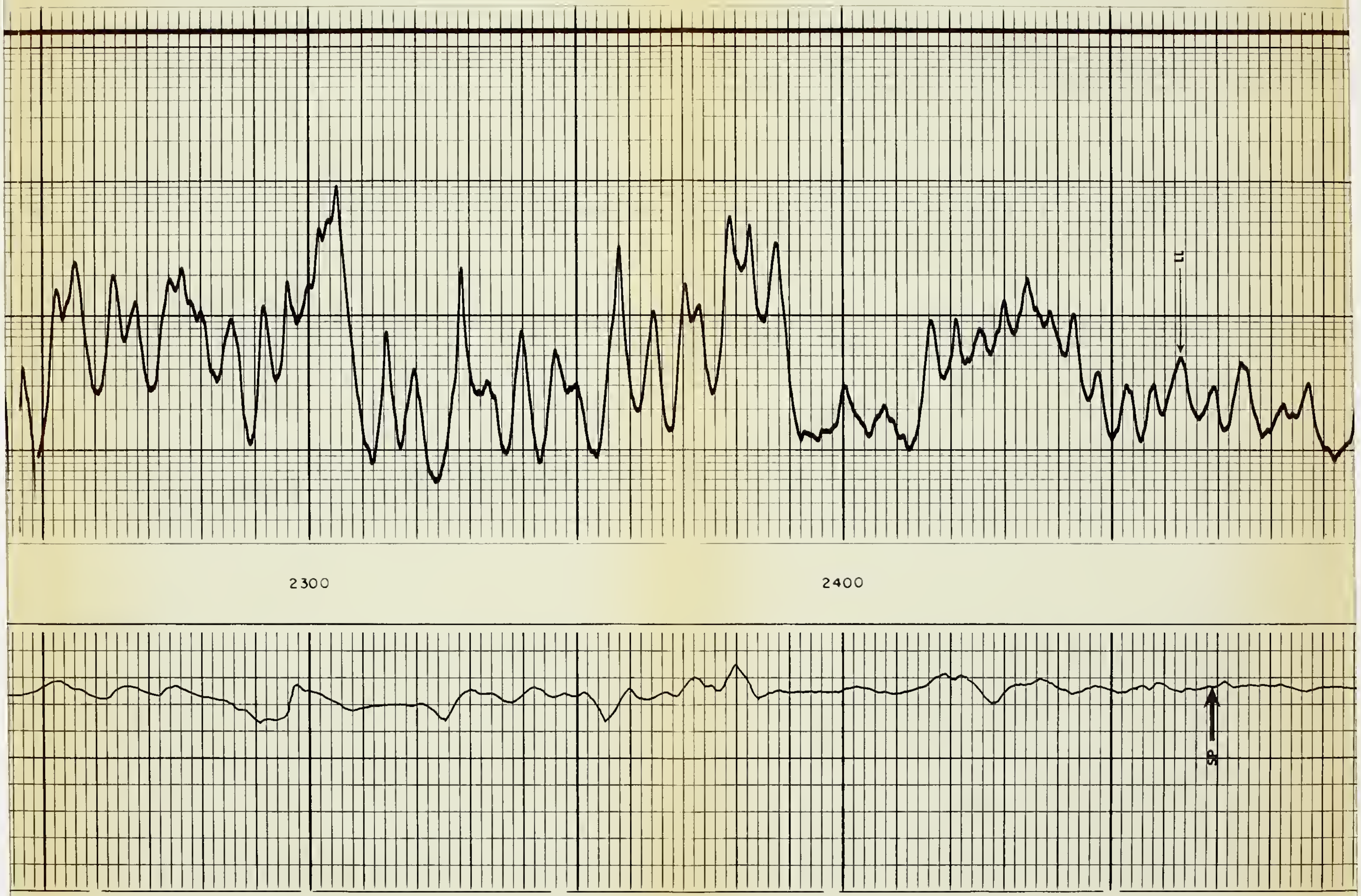
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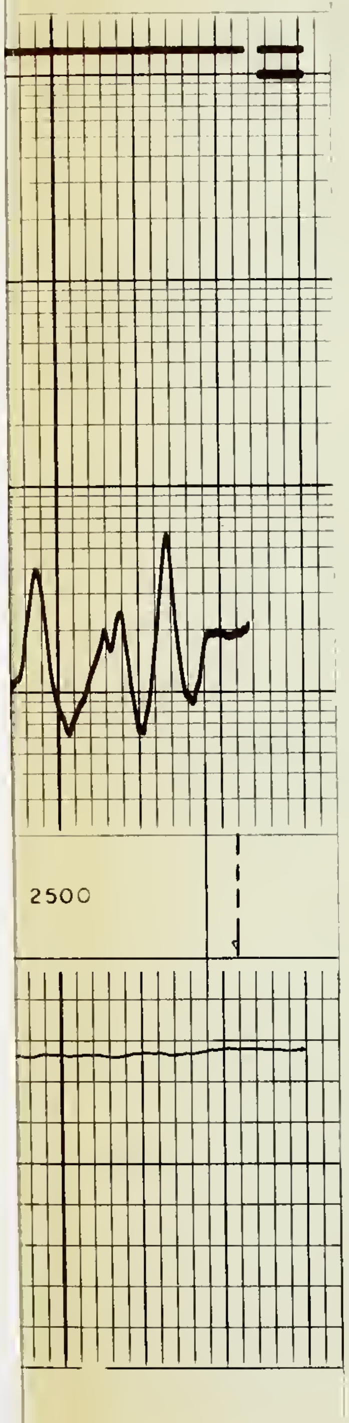
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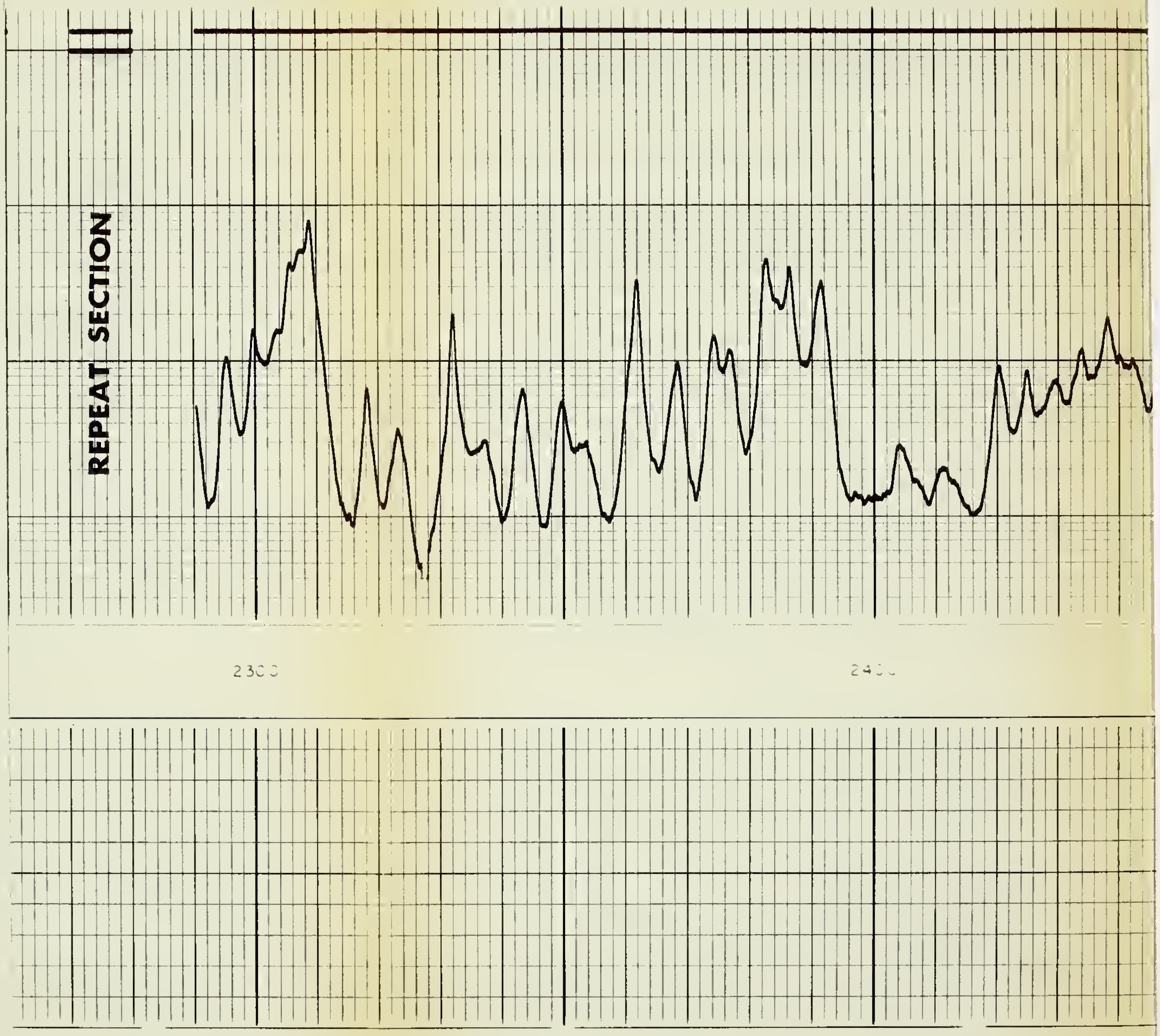
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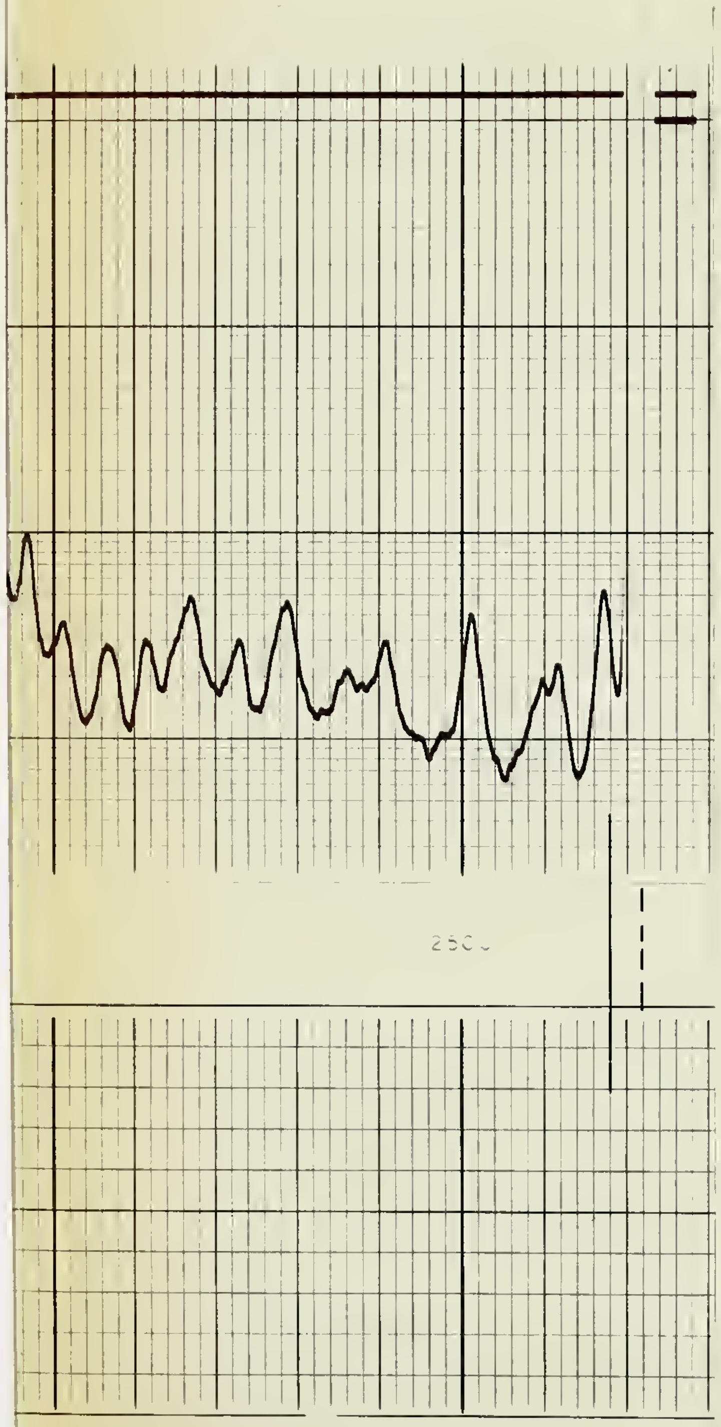
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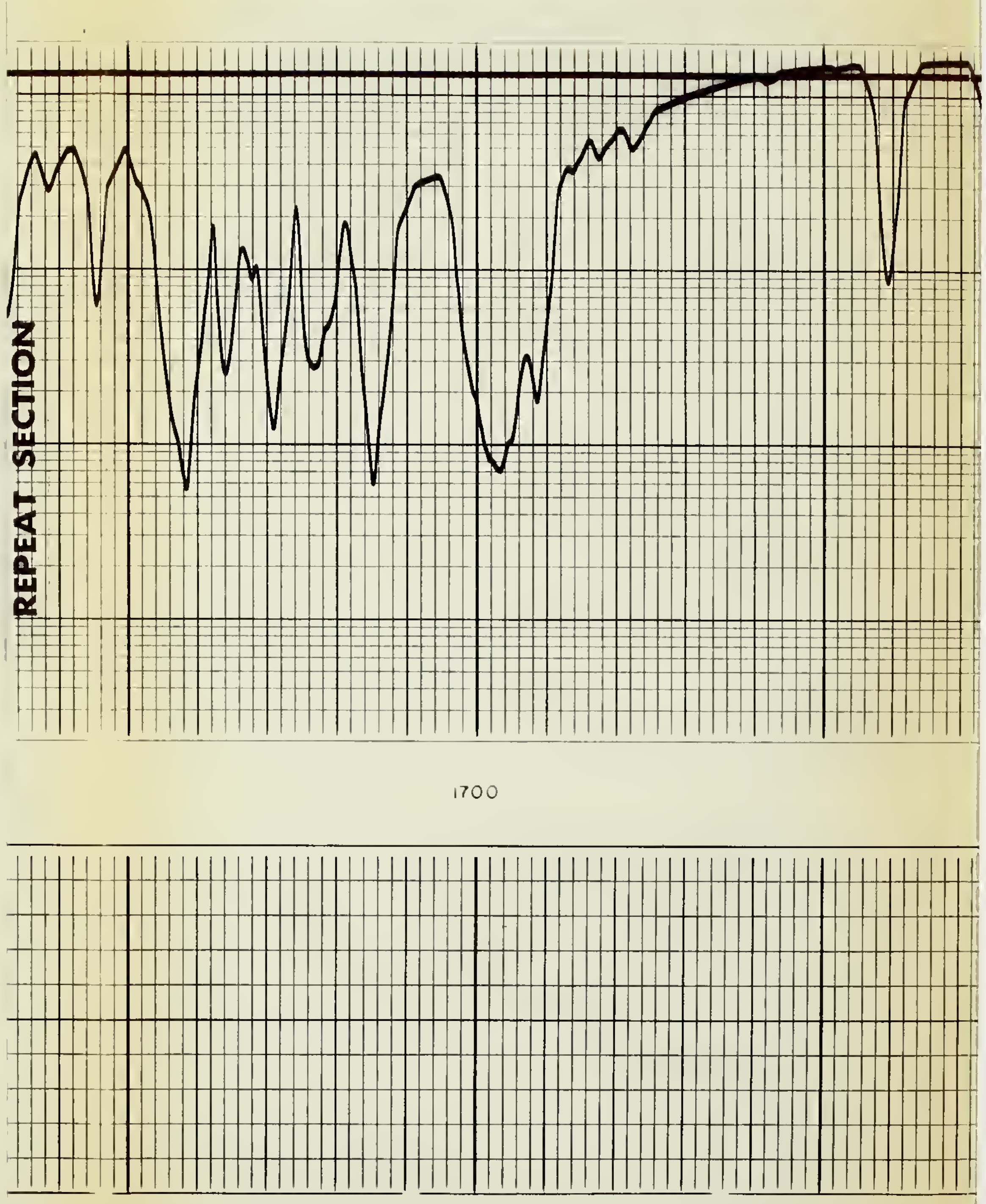
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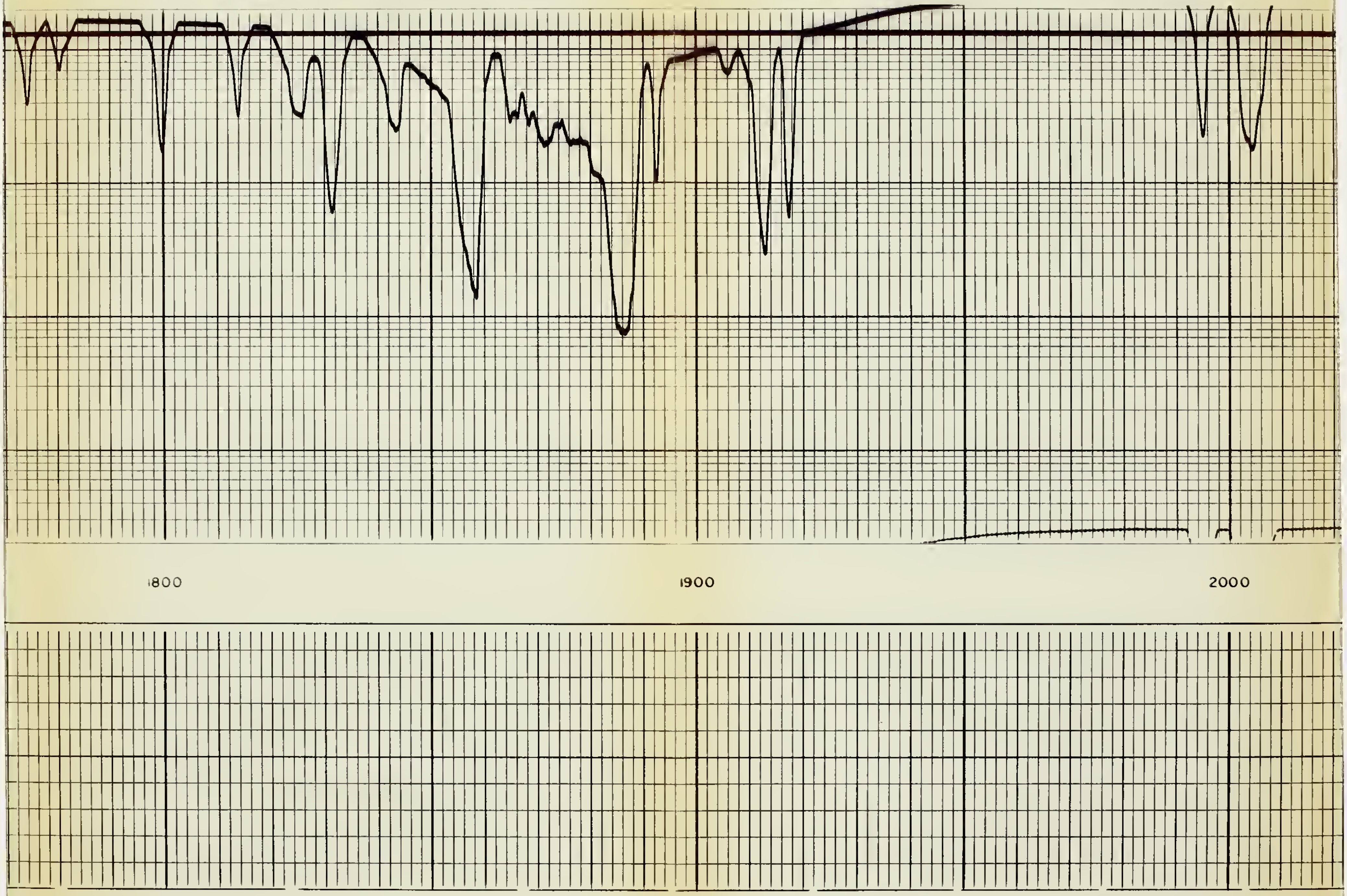
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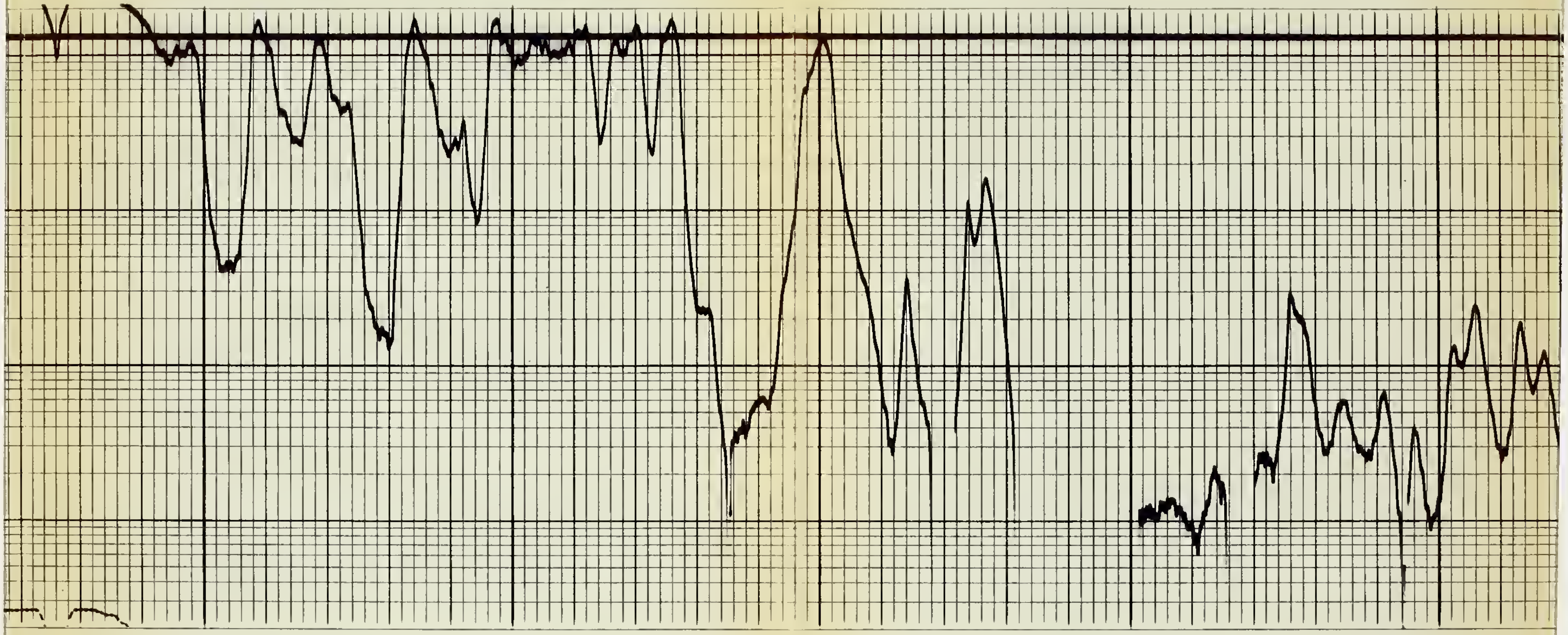
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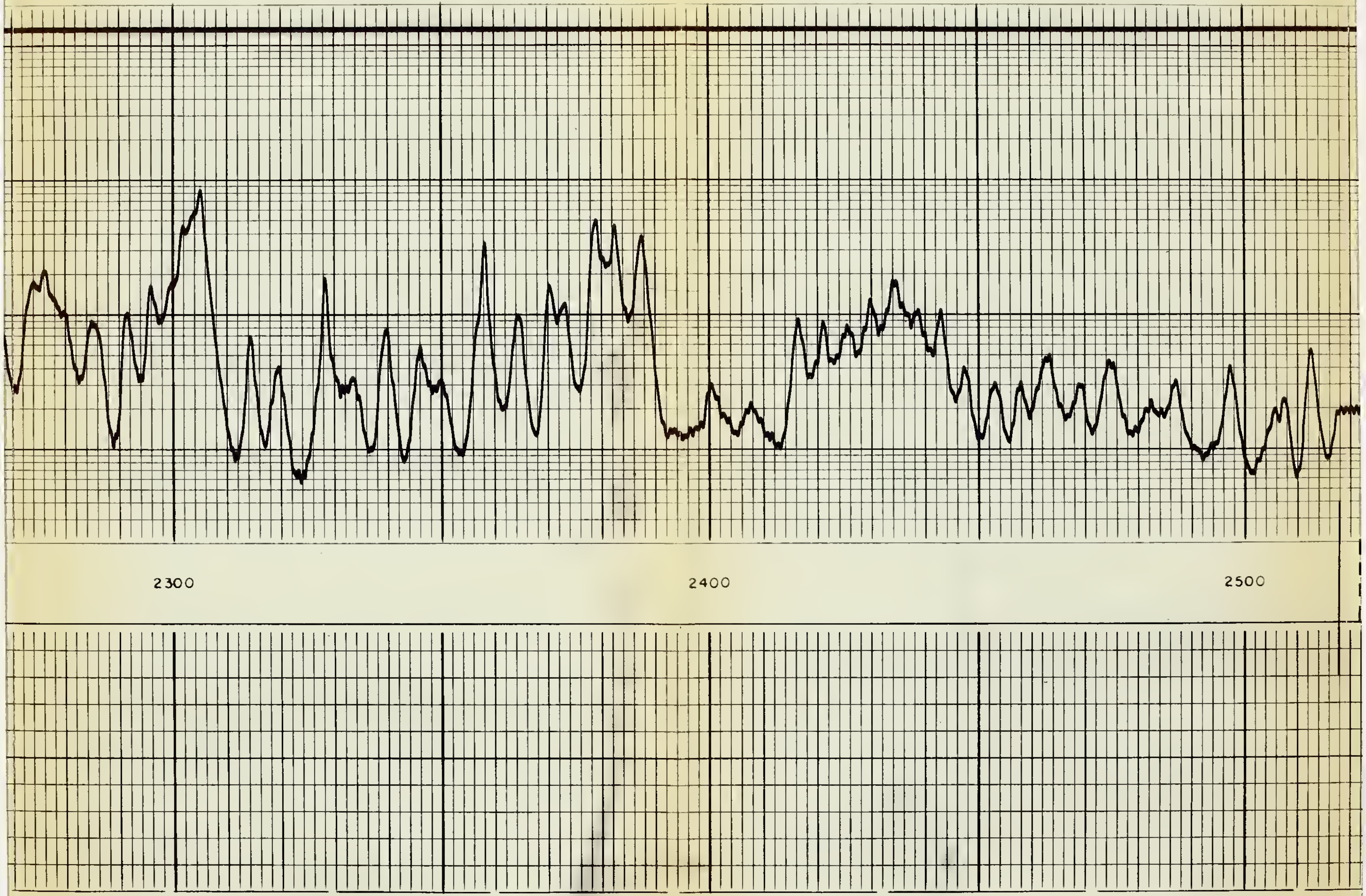
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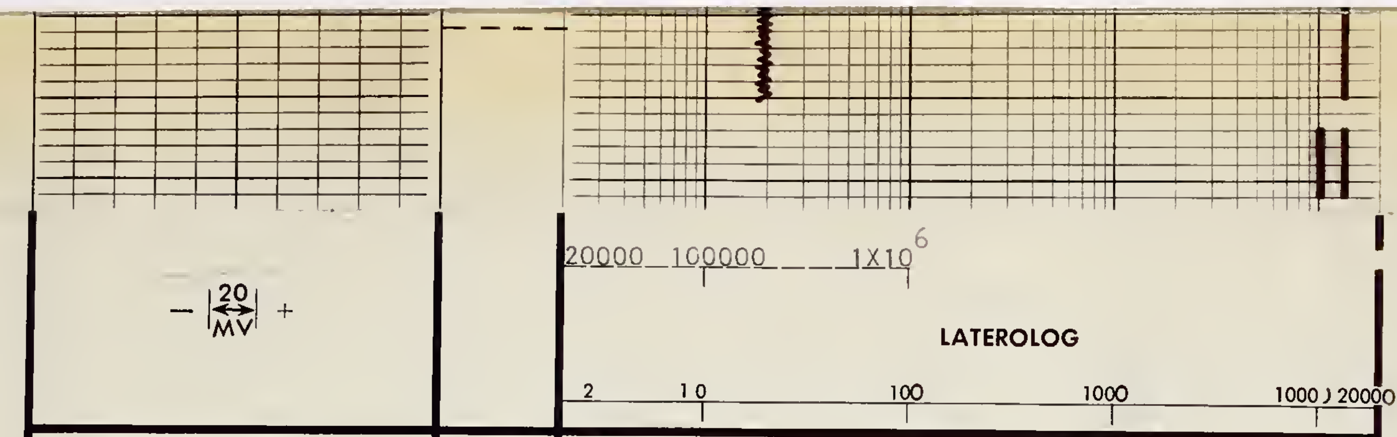
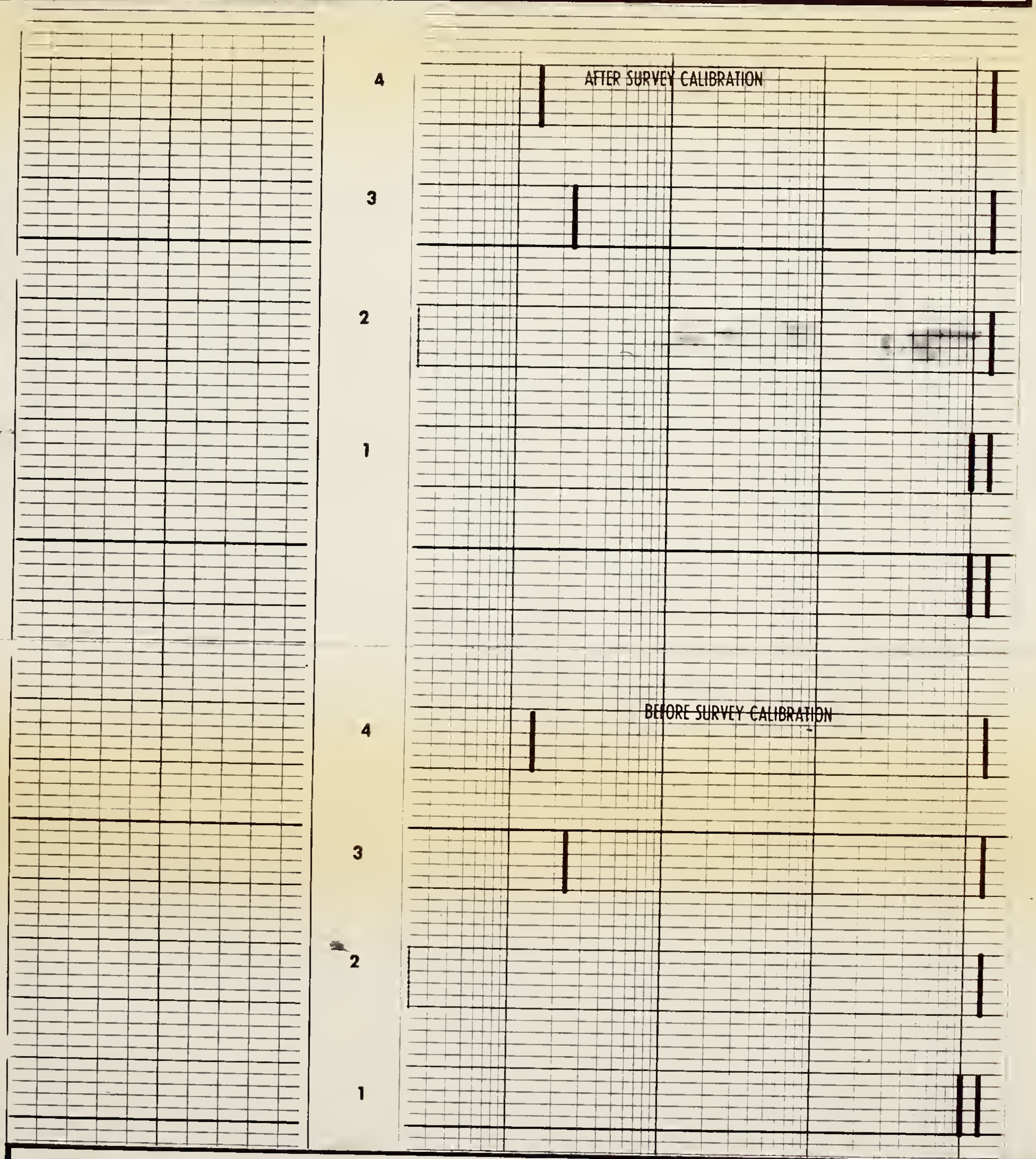


SPONTANEOUS-POTENTIAL MILLIVOLTS	DEPTHS	RESISTIVITY OHMS. M² M

COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #1
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2518
SCHL. TD 2522
DRLR TD 2525
Elev:
KB 6436.5
DF 6435.5
GL 6428

CALIBRATION RECORD



CALIBRATION RECORD

COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #1
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2518
SCHL. TD 2522
DRLR TD 2525
Elev:
KB 6436.5
DF 6435.5
GL 6428

SWS-1975-A

Schlumberger

BOREHOLE COMPENSATED SONIC LOG - GAMMA RAY

(WITH CALIPER)

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #1
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH NO. 1
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

Location: API Serial No.
1946' FEL & 1314' FSL
Sec. 2 Twp. 3S Rge. 97W

Other Services:
AMP-VDL-GR
FDC-GR
LL-7

Permanent Datum: GL ; Elev.: 6428
Log Measured From GL , 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. 6436.5
D.F. 6435.5
G.L. 6428

Date	12-6-74			
Run No.	ONE			
Depth—Driller	2525			
Depth—Logger	2522			
Btm. Log Interval	2510			
Top Log Interval	100			
Casing—Driller	8 5/8 @ 156	@	@	@
Casing—Logger	154			
Bit Size	6-3/4			
Type Fluid in Hole	FRESH WATER			
Fluid Level	156			
Dens. | Visc.	8.0 | -	|	|	|
pH | Fluid Loss	- | - ml	| ml	| ml	| ml
Source of Sample	MUDPIT			
R_m @ Meas. Temp.	3.9 @ 64 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
Source: R_{mf} | R_{mc}	CLEAR | WATER	|	|	|
R_m @ BHT	2.2 @ 119 °F	@ °F	@ °F	@ °F
Time Since Circ.	4 HOURS			
Max. Rec. Temp.	119 °F	°F	°F	°F
Equip. | Location	7683 | VRNL	|	|	|
Recorded By	YATCHAK/ETTER			
Witnessed By	BURNS			

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.		
Depth - Driller		
Type Fluid in Hole		
Dens. | Visc.		
ph | Fluid Loss	ml	ml
Source of Sample		
R_m @ Meas. Temp.	@ °F	@ °F
R_{mf} @ Meas. Temp.	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F
Source: R_{mf} | R_{mc}		
R_m @ BHT	@ °F	@ °F
R_{mf} @ BHT	@ °F	@ °F
R_{mc} @ BHT	@ °F	@ °F

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

REMARKS
Service Order No. - 6930
CART. GAIN 1/5
PNL. GAIN 60-90
SEE VDL LOG FOR CENTRALIZER ARRAY

EQUIPMENT DATA

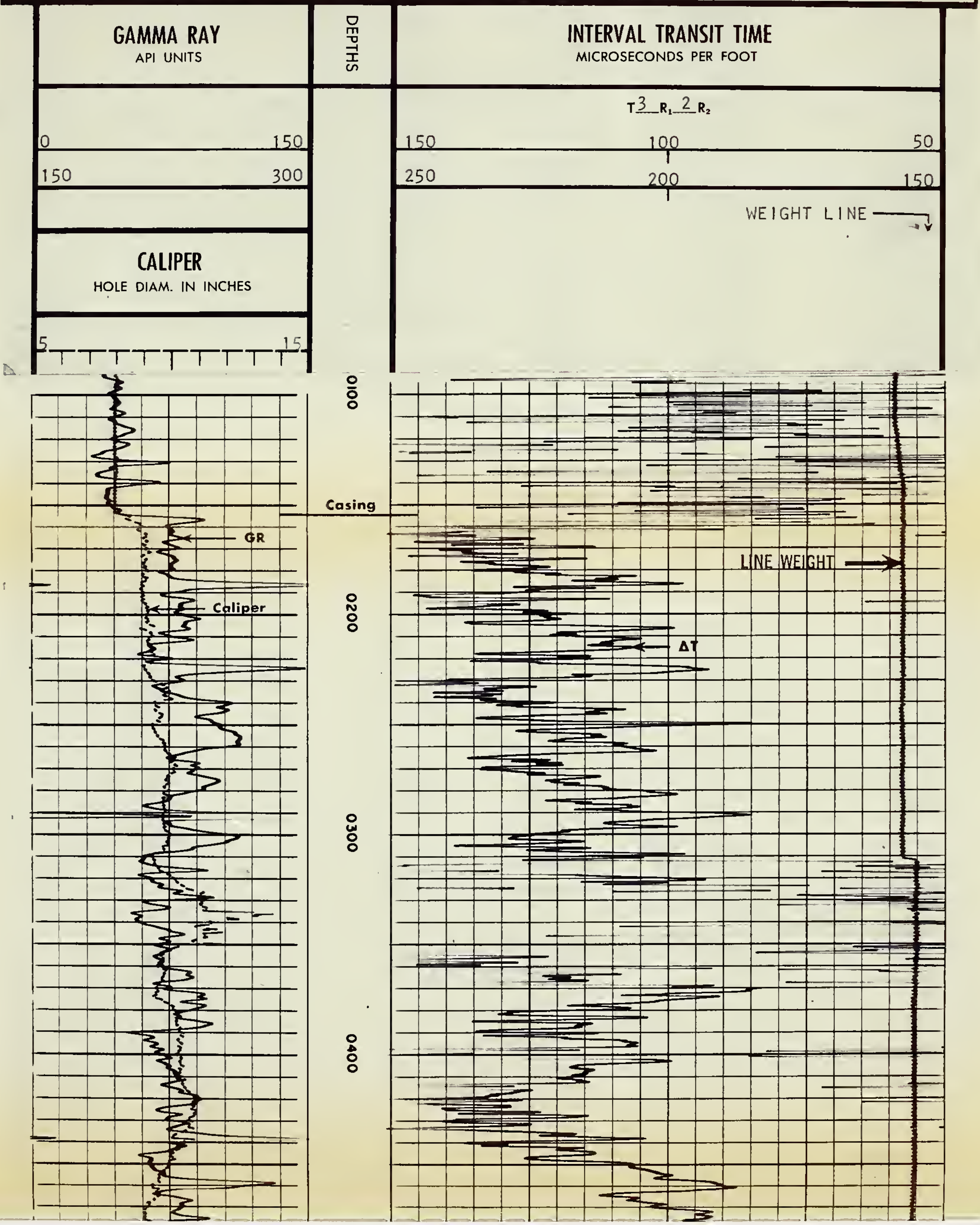
Run No.	ONE		
Sonic Panel No.	110		
Sonic Cart No.	130		
Sonic Sonde No.	180		
Mem. Panel No.	166		
G.R. Cart. No.	204		
G.R. Panel No.	166		
Caliper No	929		
TTR No.	-		
Cent. Device	YES		
Stand off - Inches	3/4 & BOWSPRING		
Time Const. - Sec.	2		
Speed - F.P.M.	30		

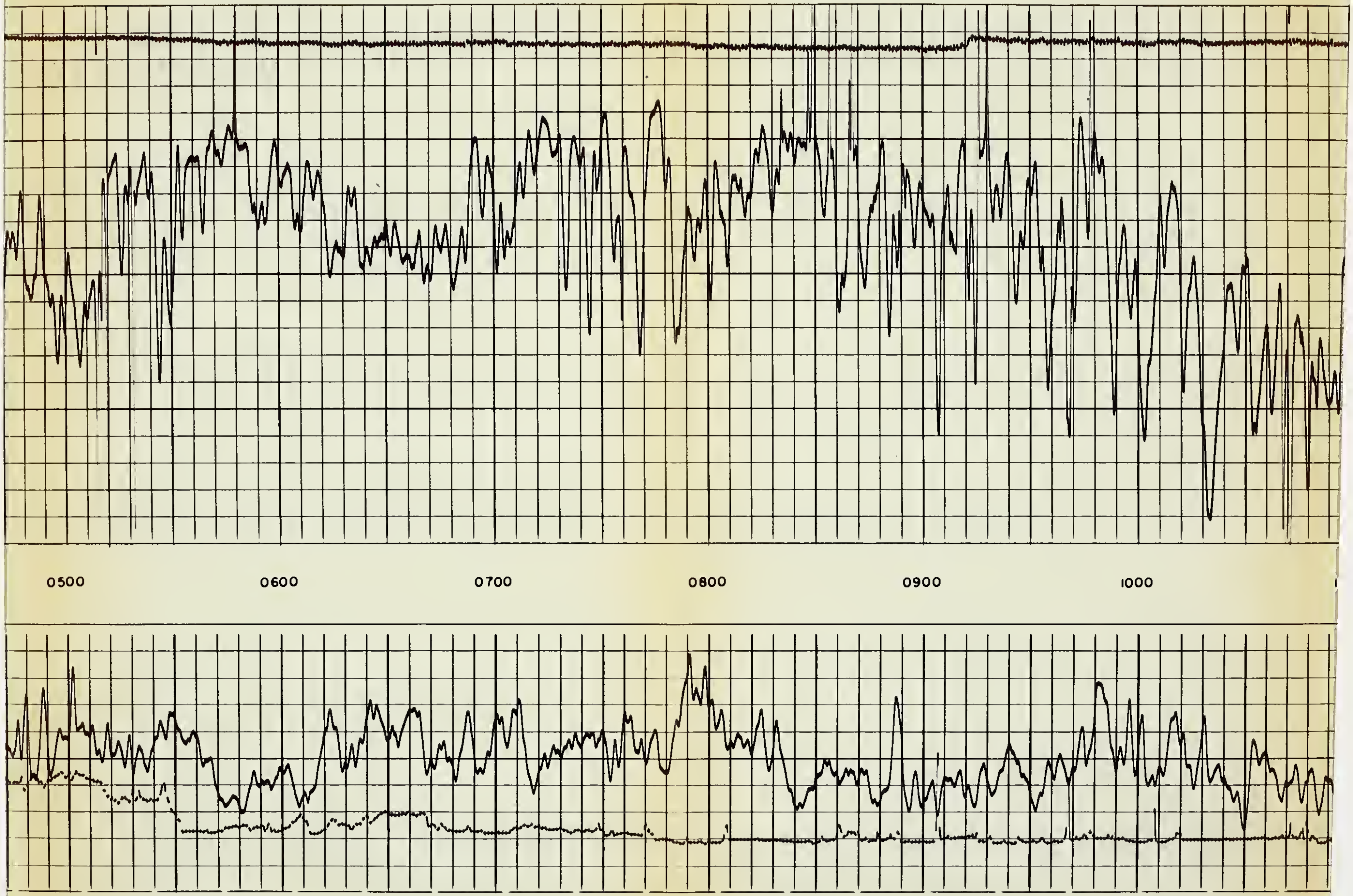
CALIBRATION DATA

CALIBRATION:	BACKGND.	SOURCE	GALV. INCR.	SENS. TAP	SENS. TAP	TIME

CALIBRATION:	BACKGND. CPS.	SOURCE CPS.	GALV. INCR. DIVISION	SENS. TAP (FOR CAL.)	SENS. TAP (RECORD)	TIME CONST.
GAMMA RAY:	70	290	10	0-165	0-150	2

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

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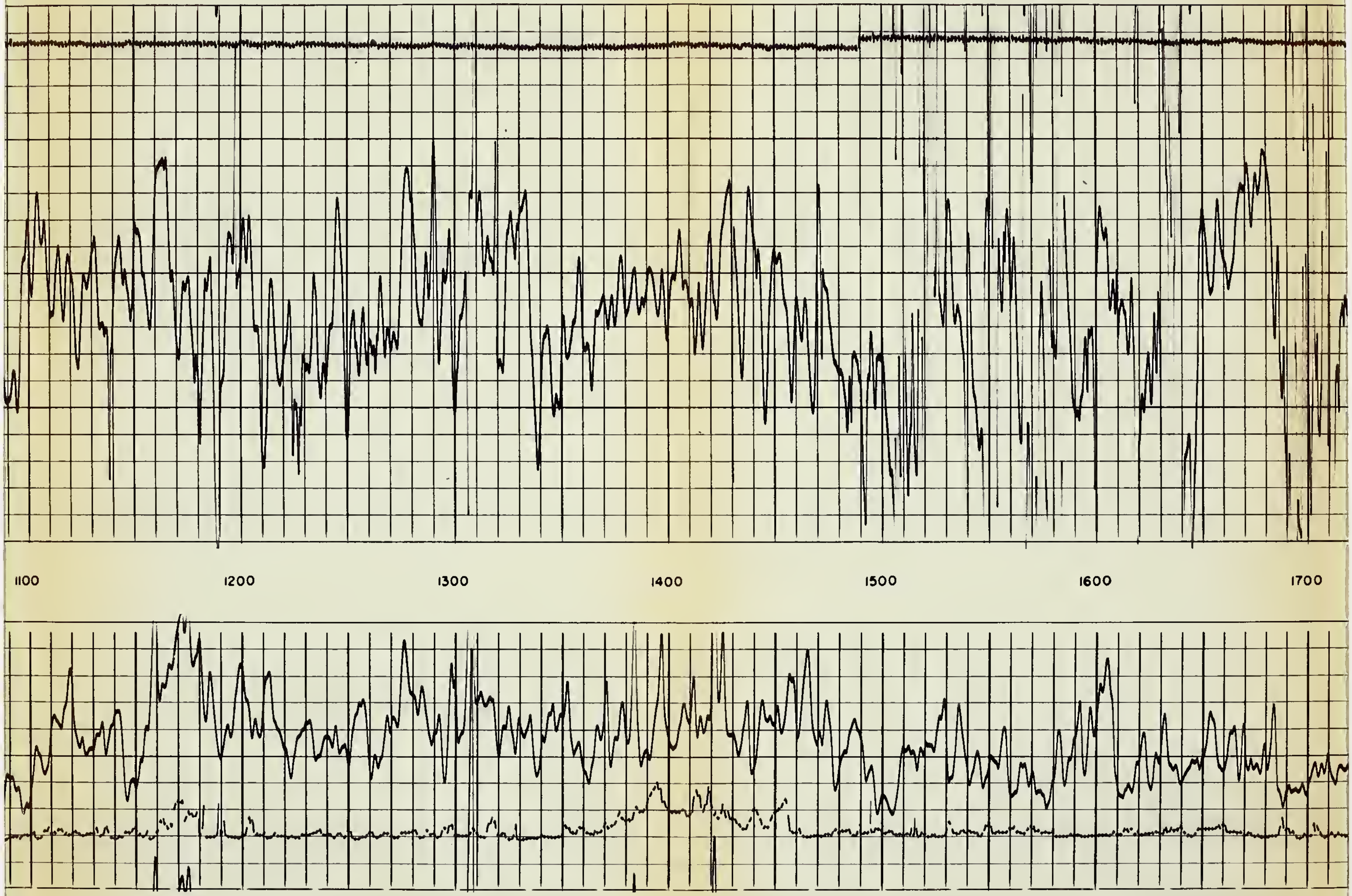
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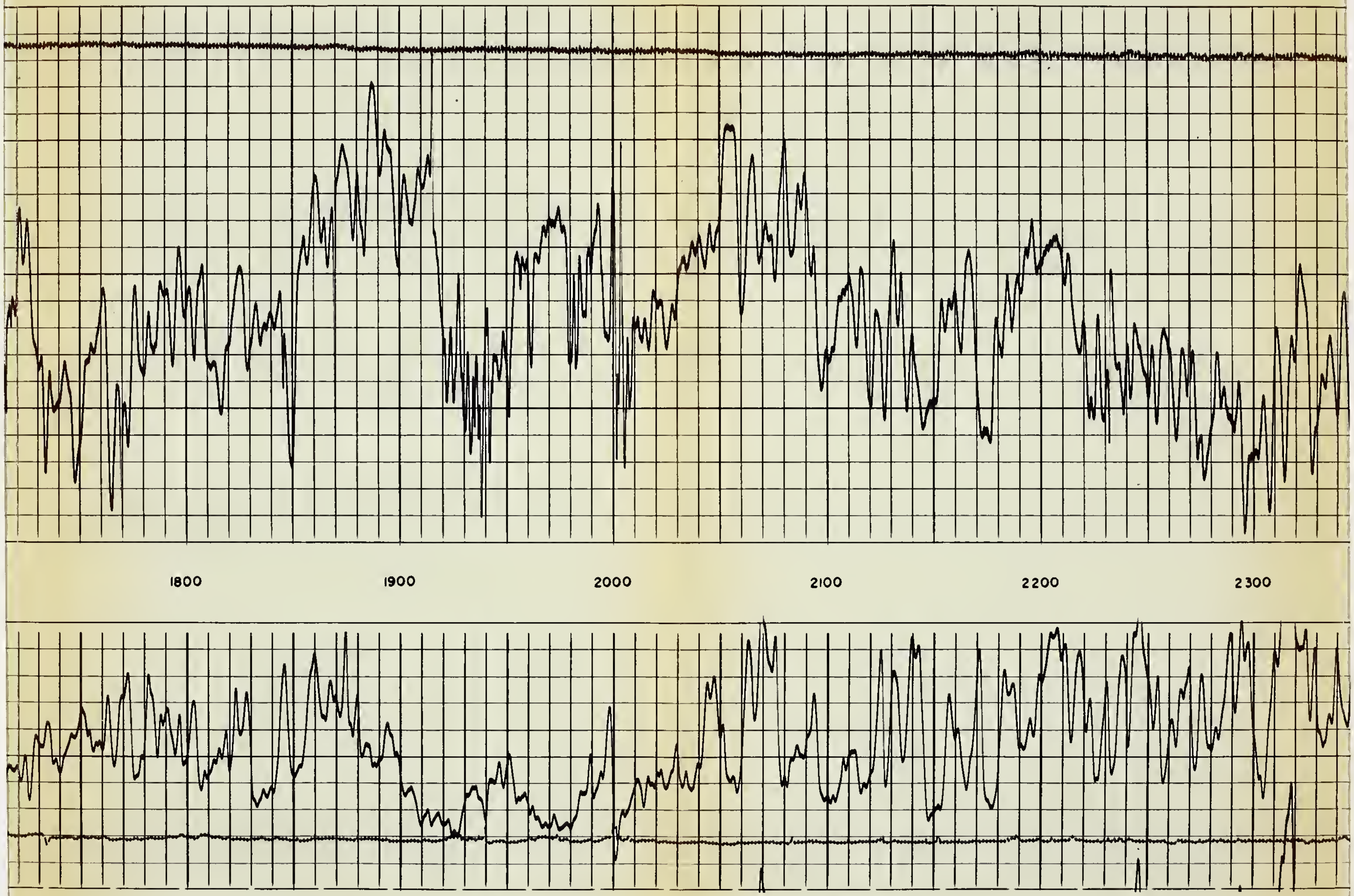
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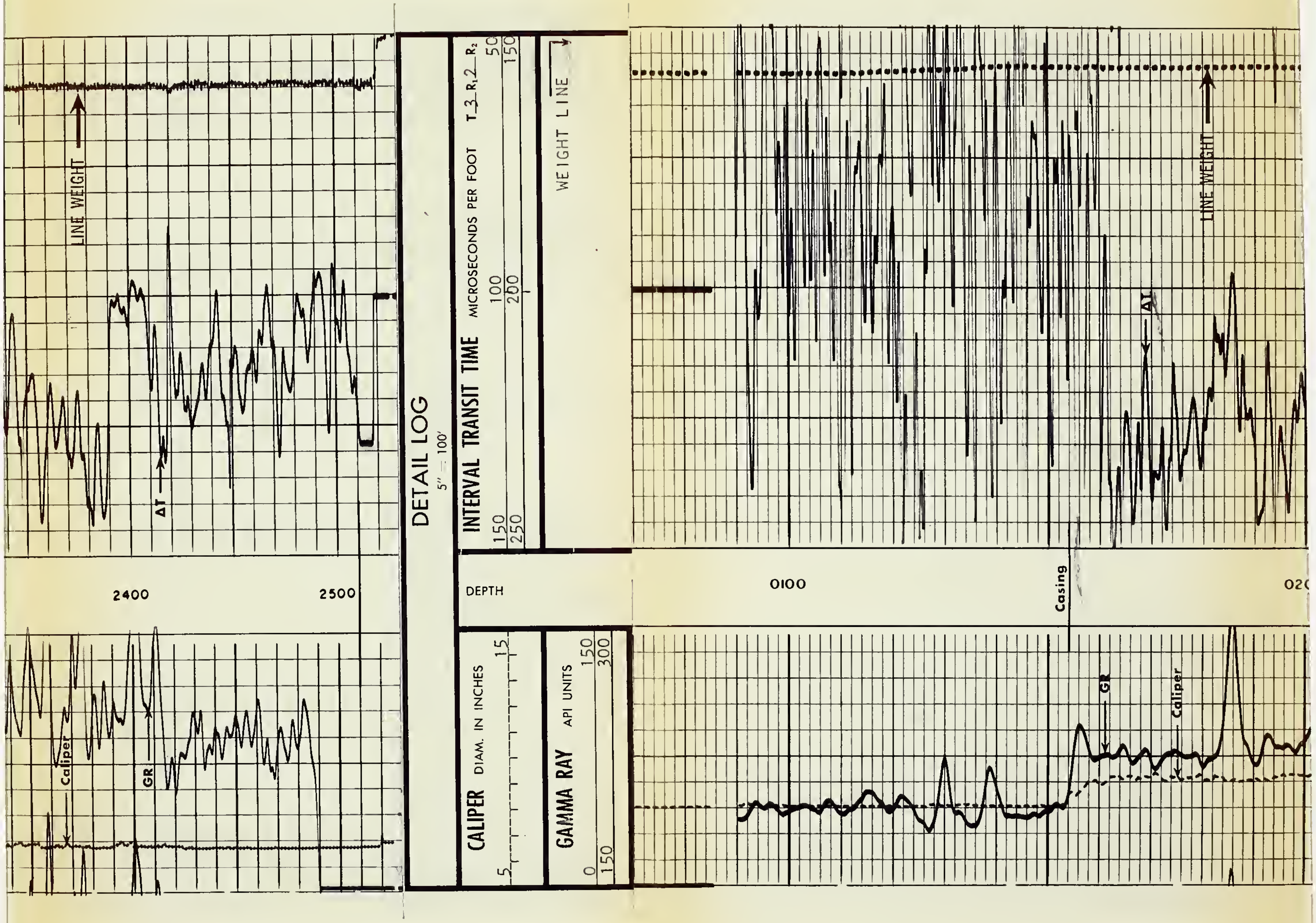
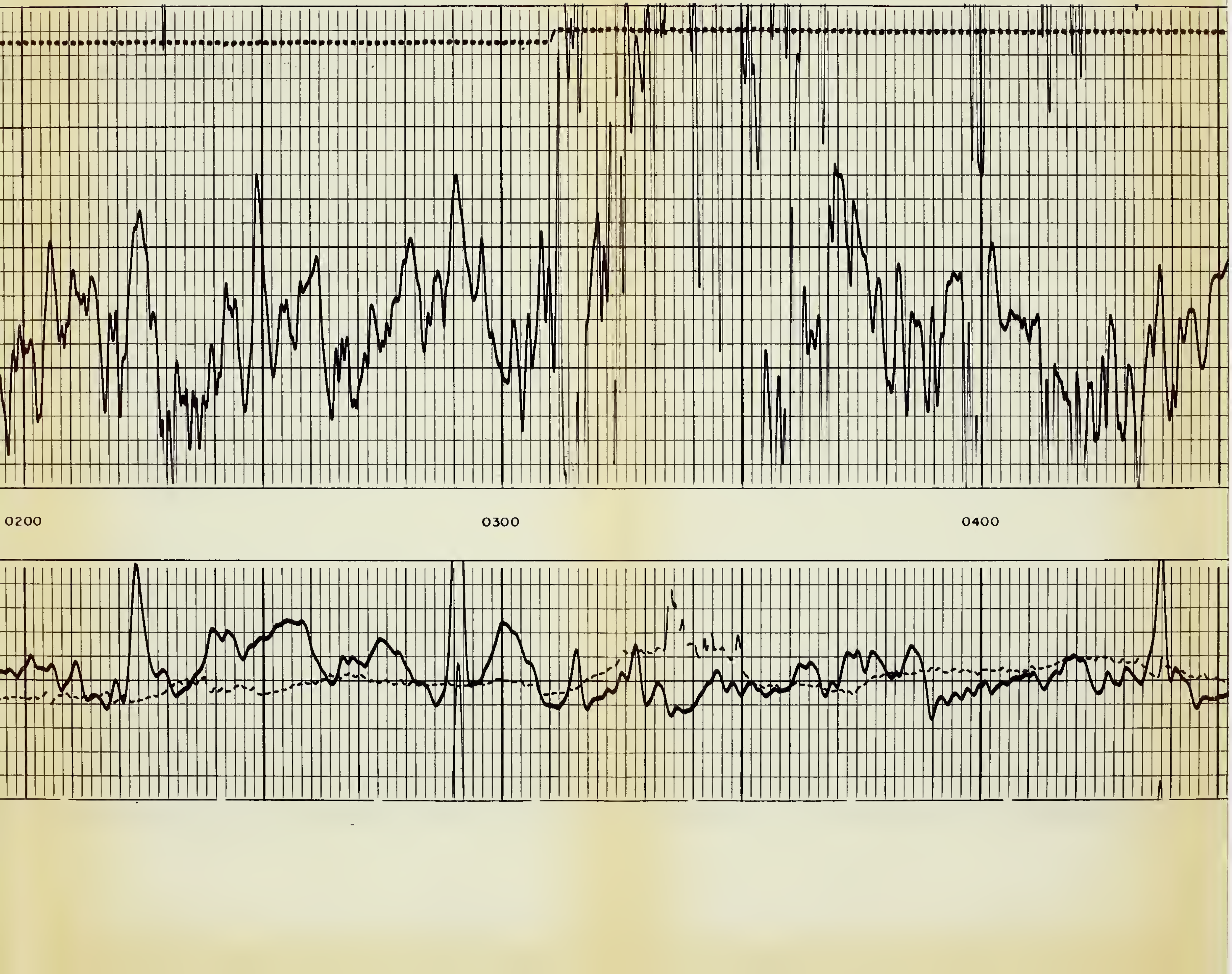

LINE WEIGHT
ΔT
GR
Caliper
2400
2500
DETAIL LOG
5" = 100'
INTERVAL TRANSIT TIME
MICROSECONDS PER FOOT
T 3 R1 2 R2
150 100 50
250 200 150
WEIGHT LINE
DEPTH
CALIPER DIAM. IN INCHES
5 15
GAMMA RAY API UNITS
0 150
150 300
0100
020
Casing
ΔT
LINE WEIGHT
GR
Caliper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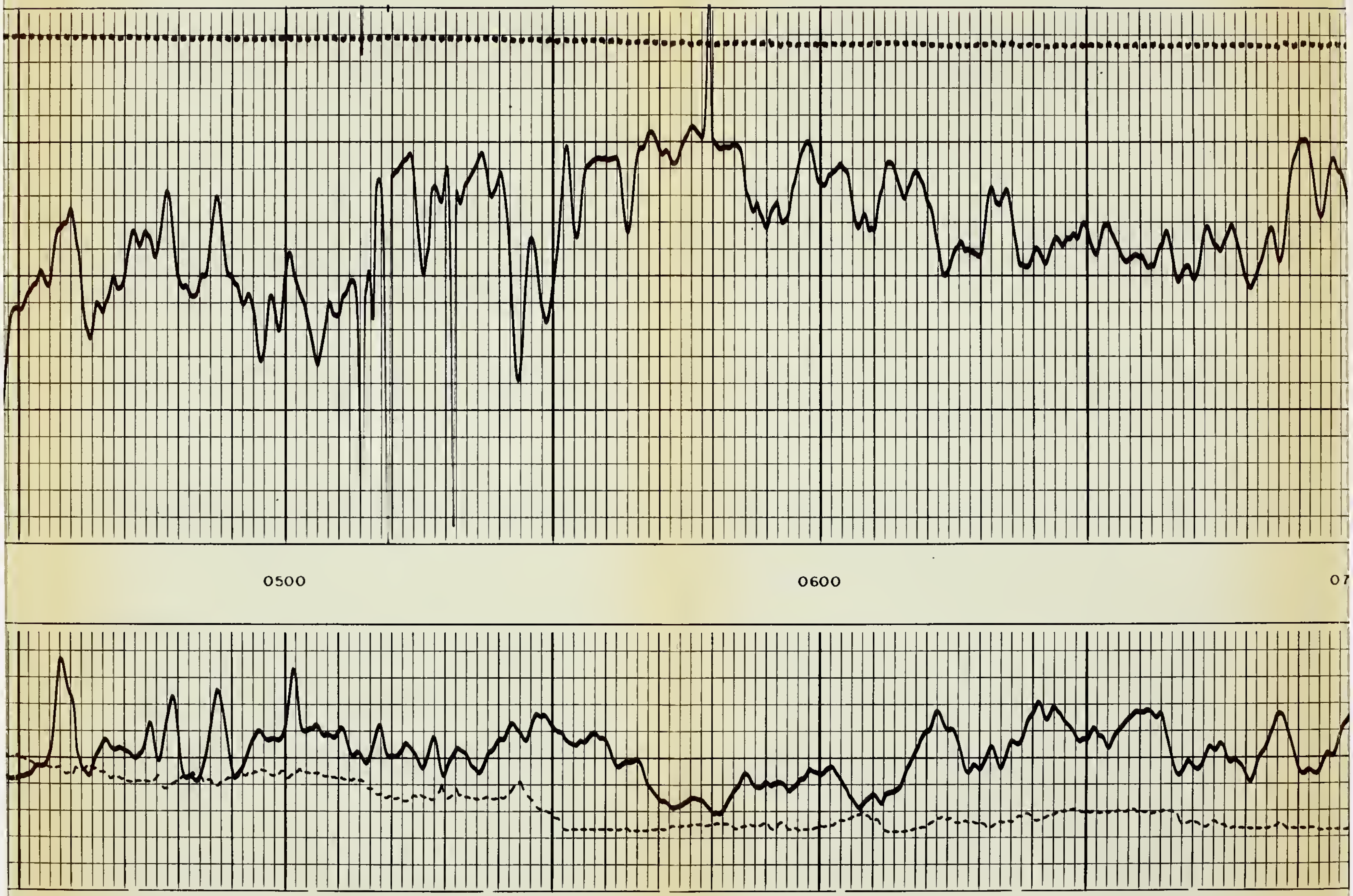
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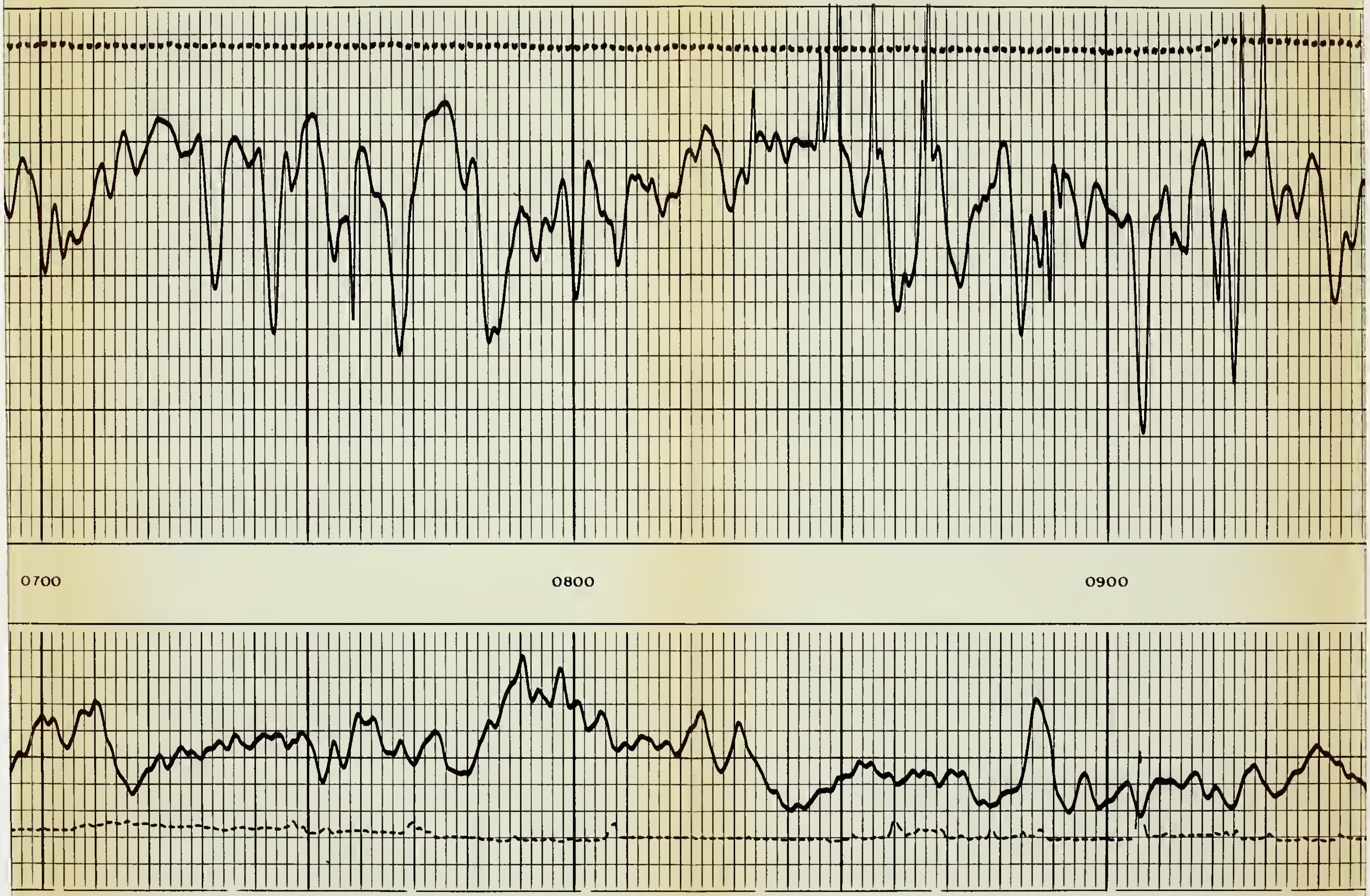
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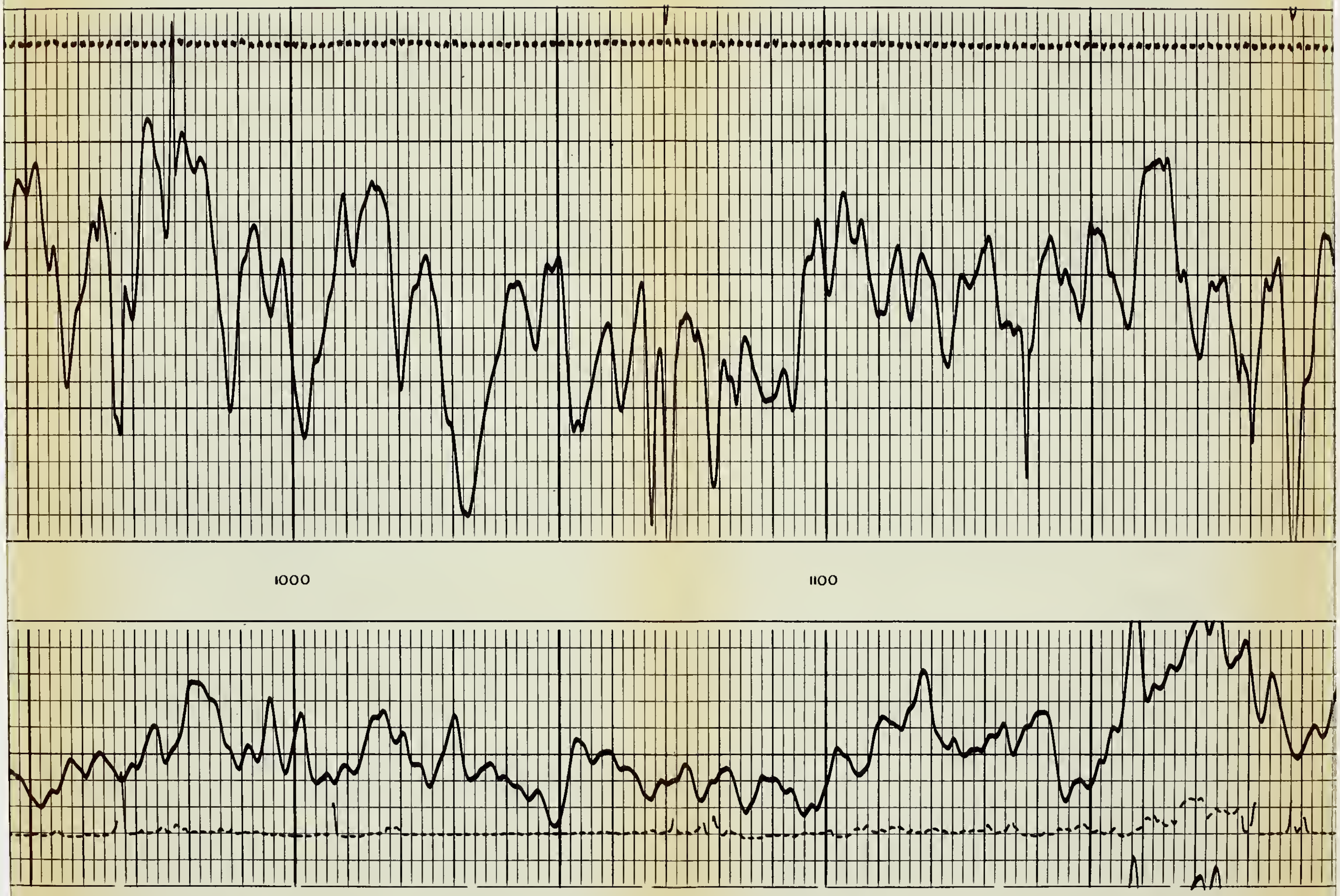
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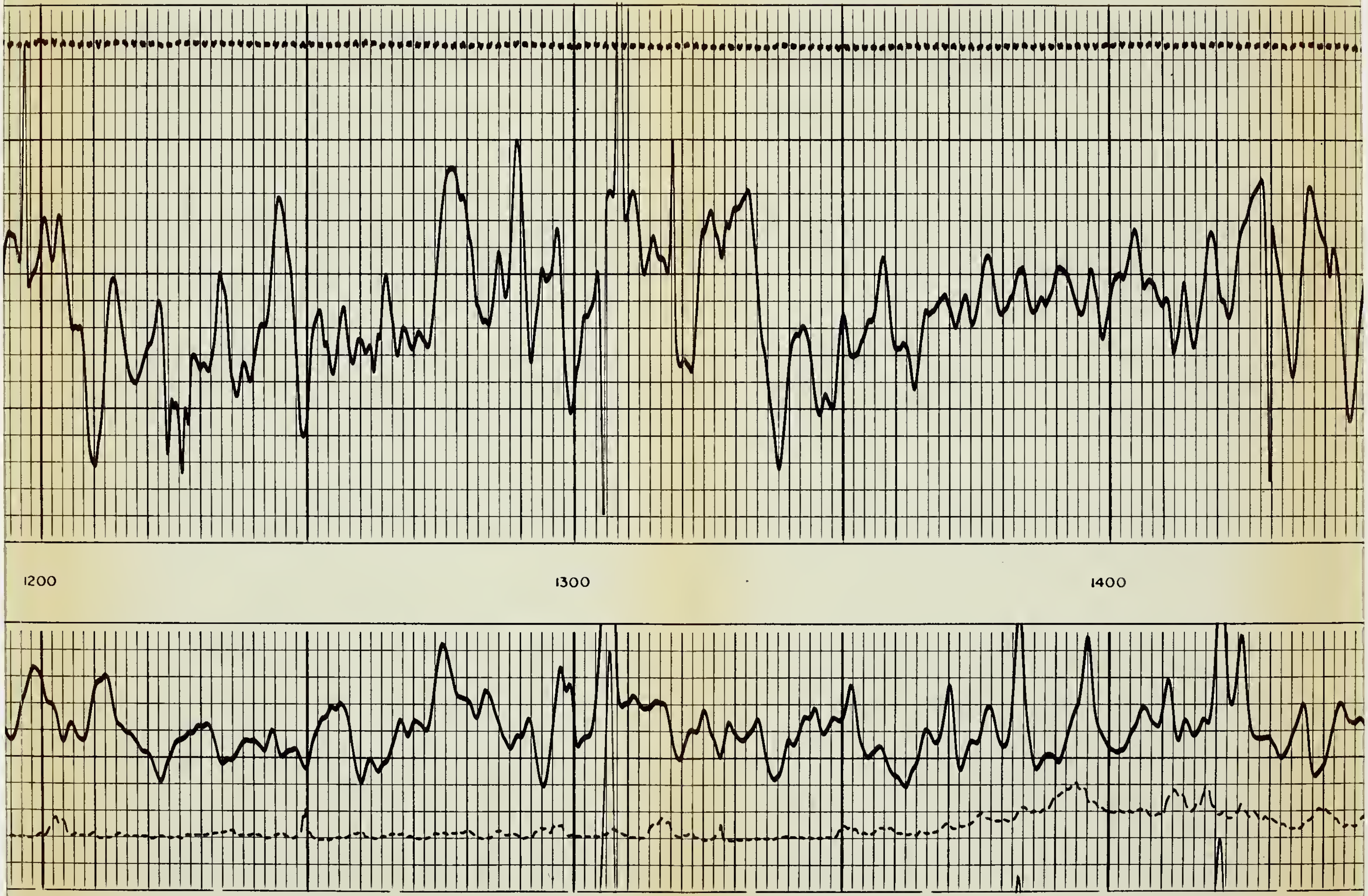
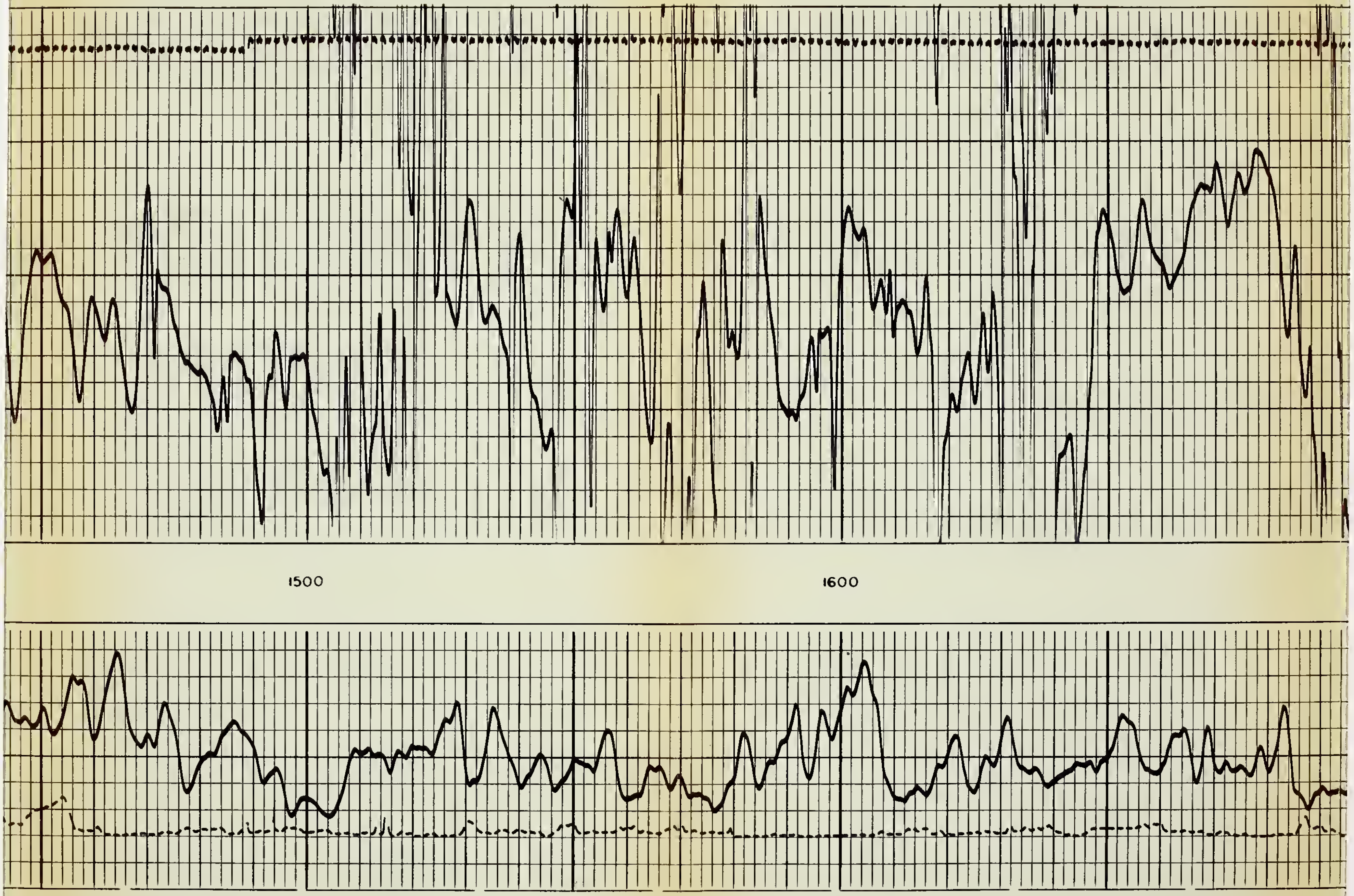

1200
1300
1400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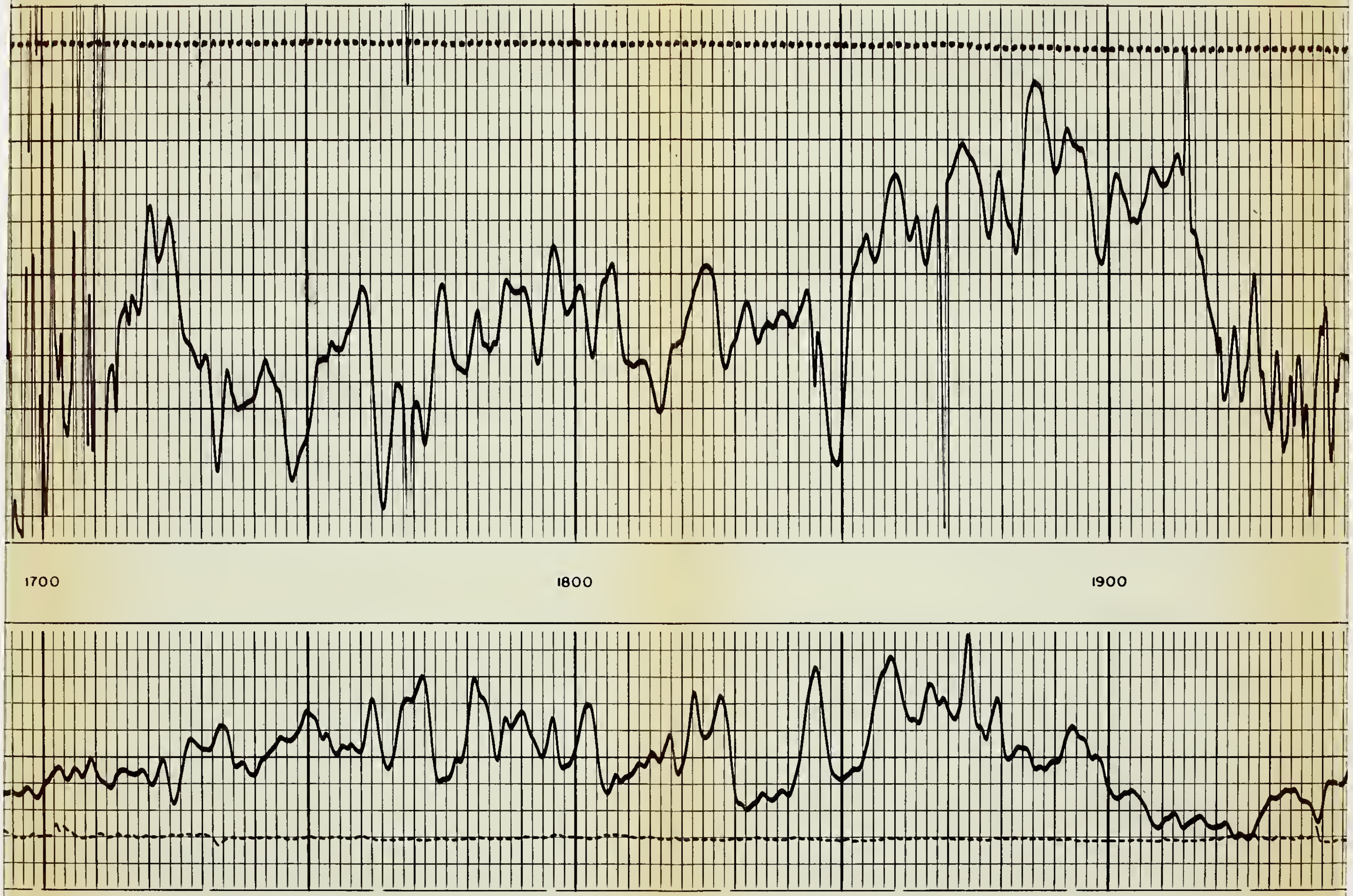
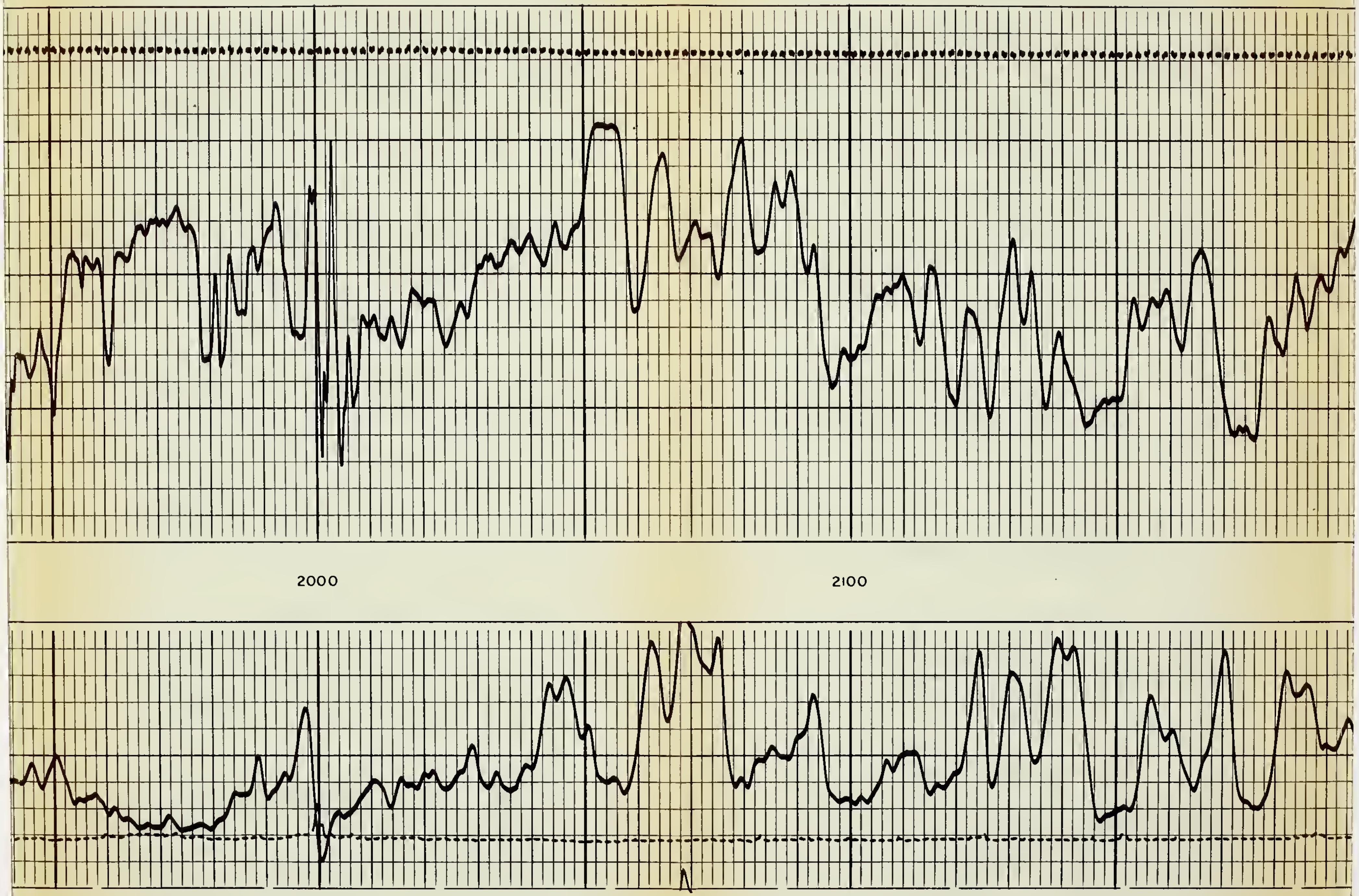
1600


1700
1800
1900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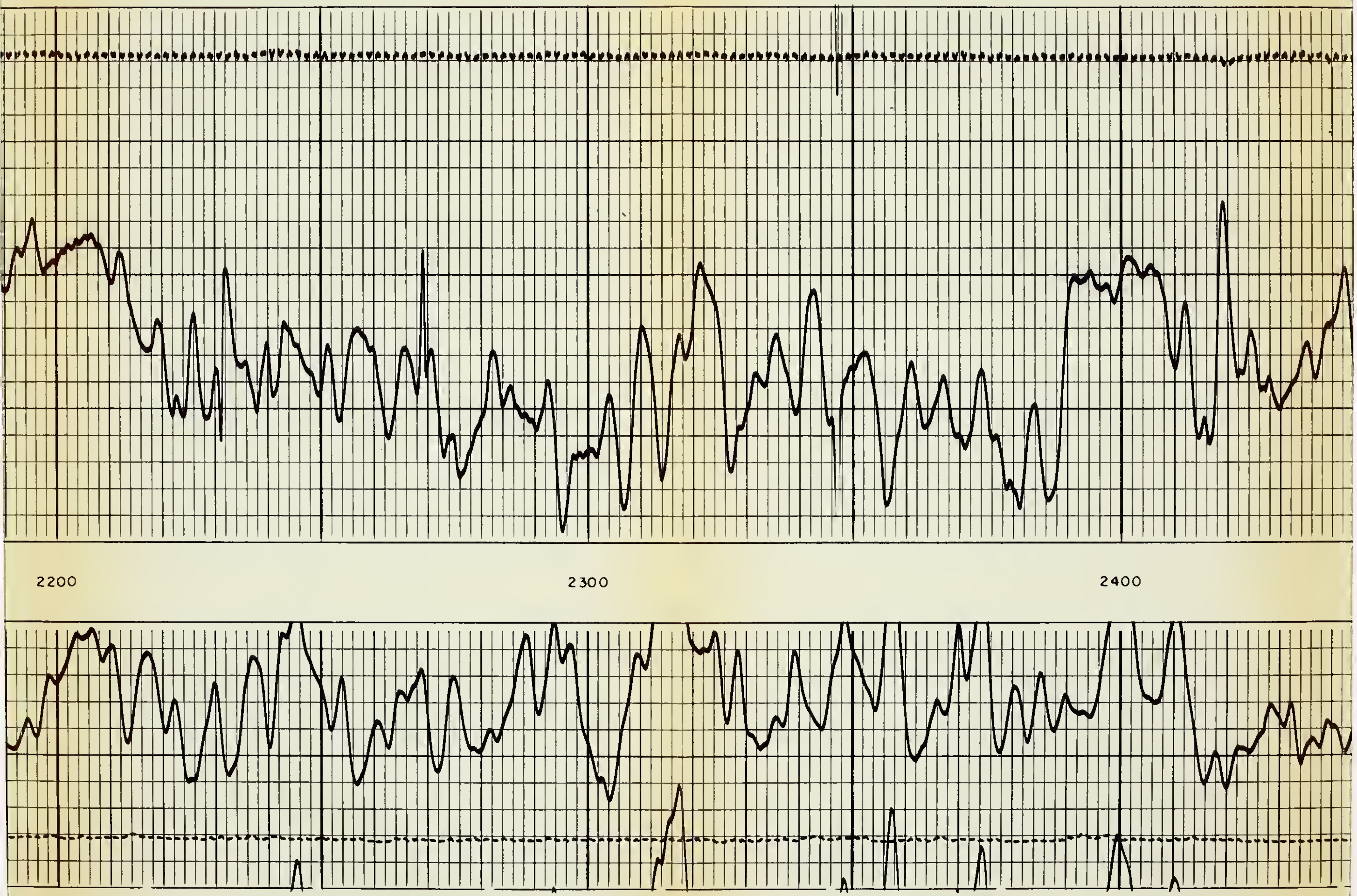
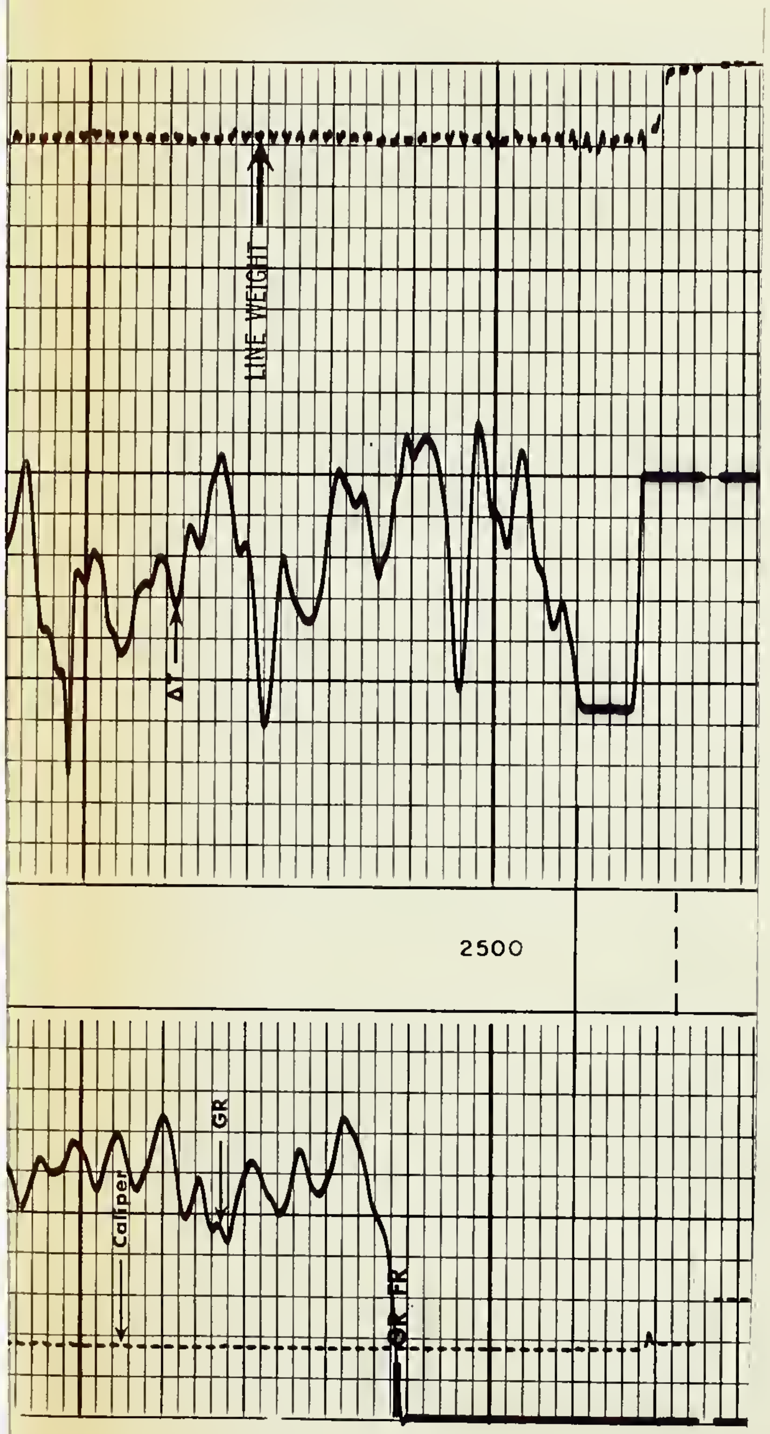
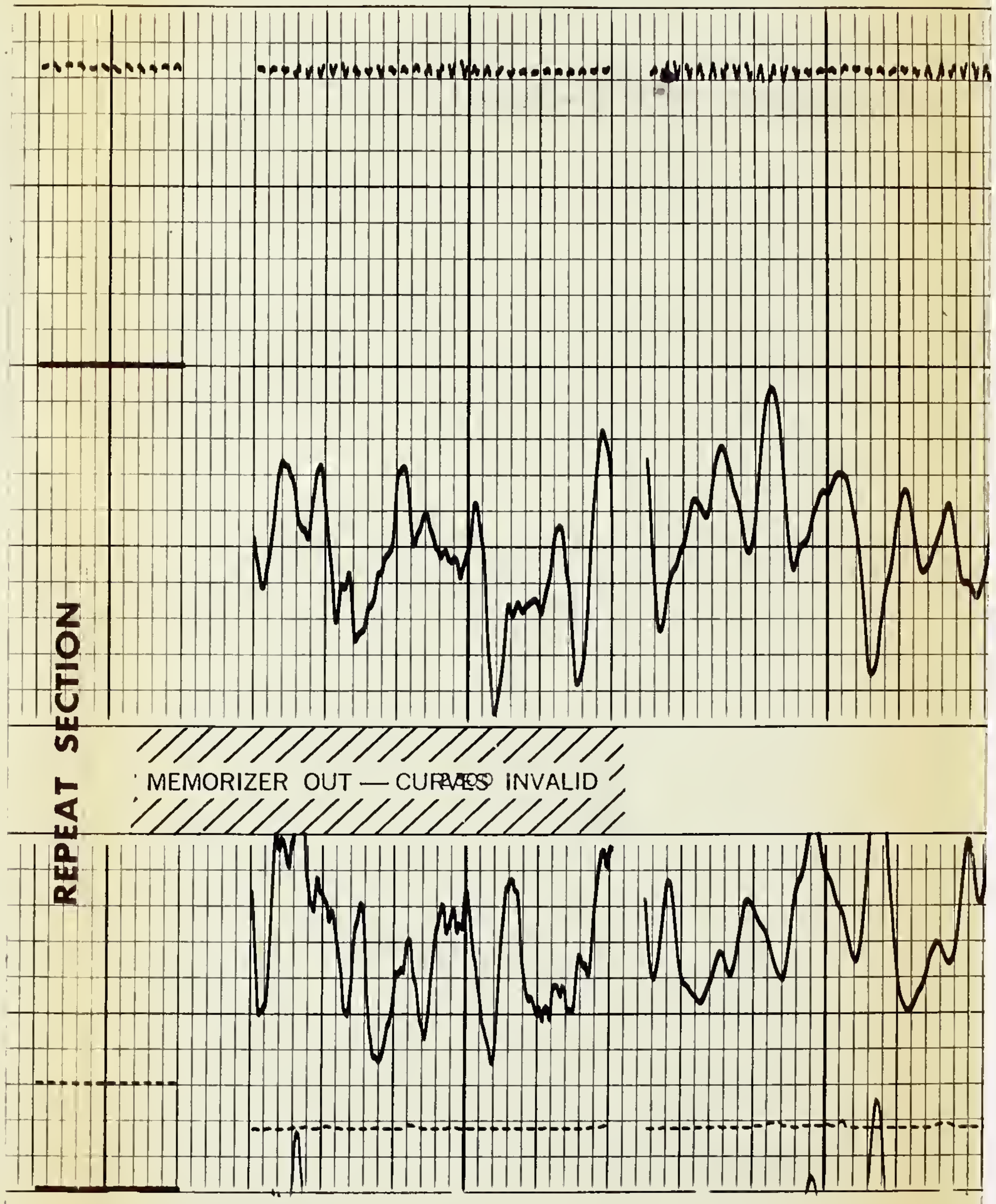
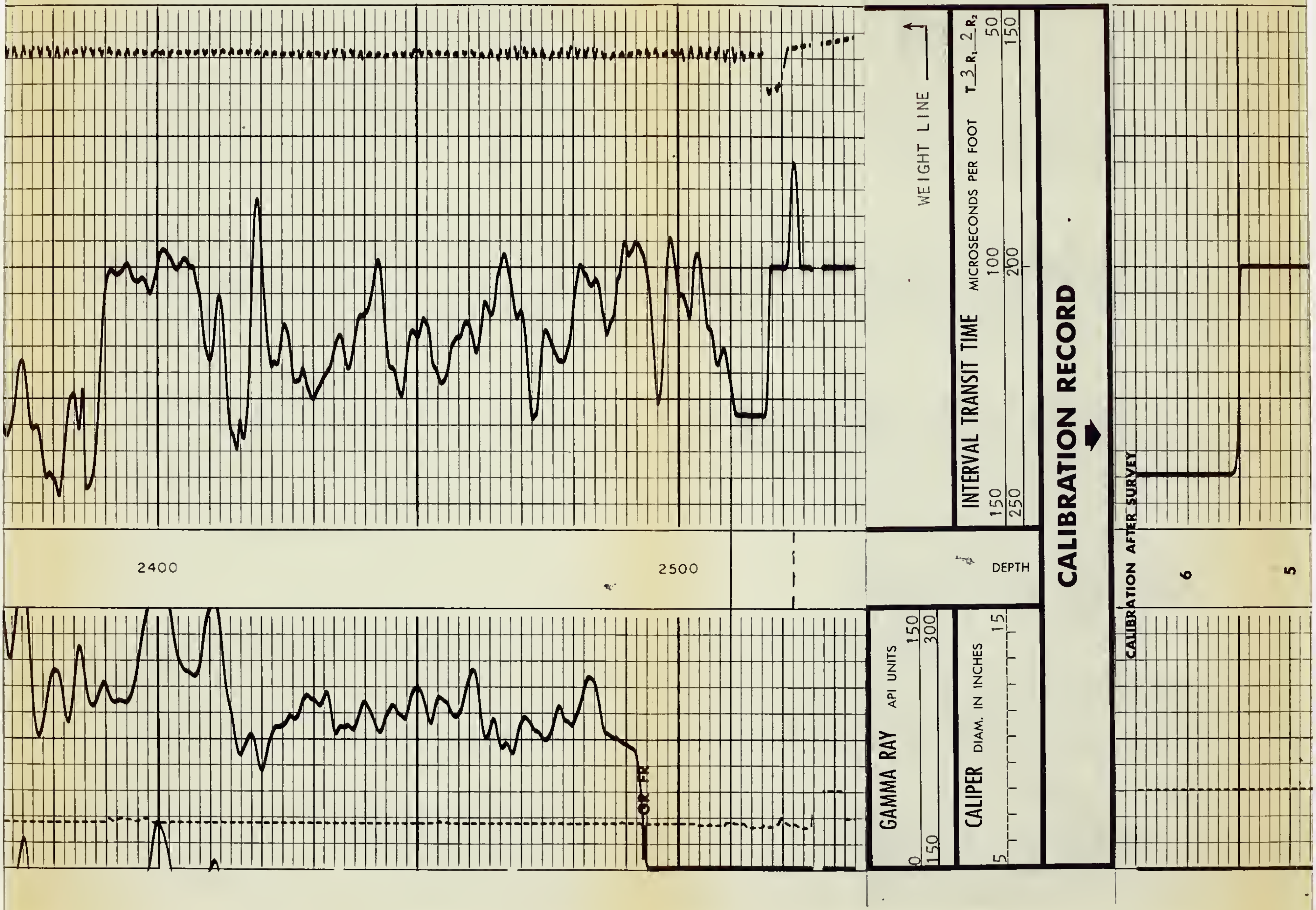
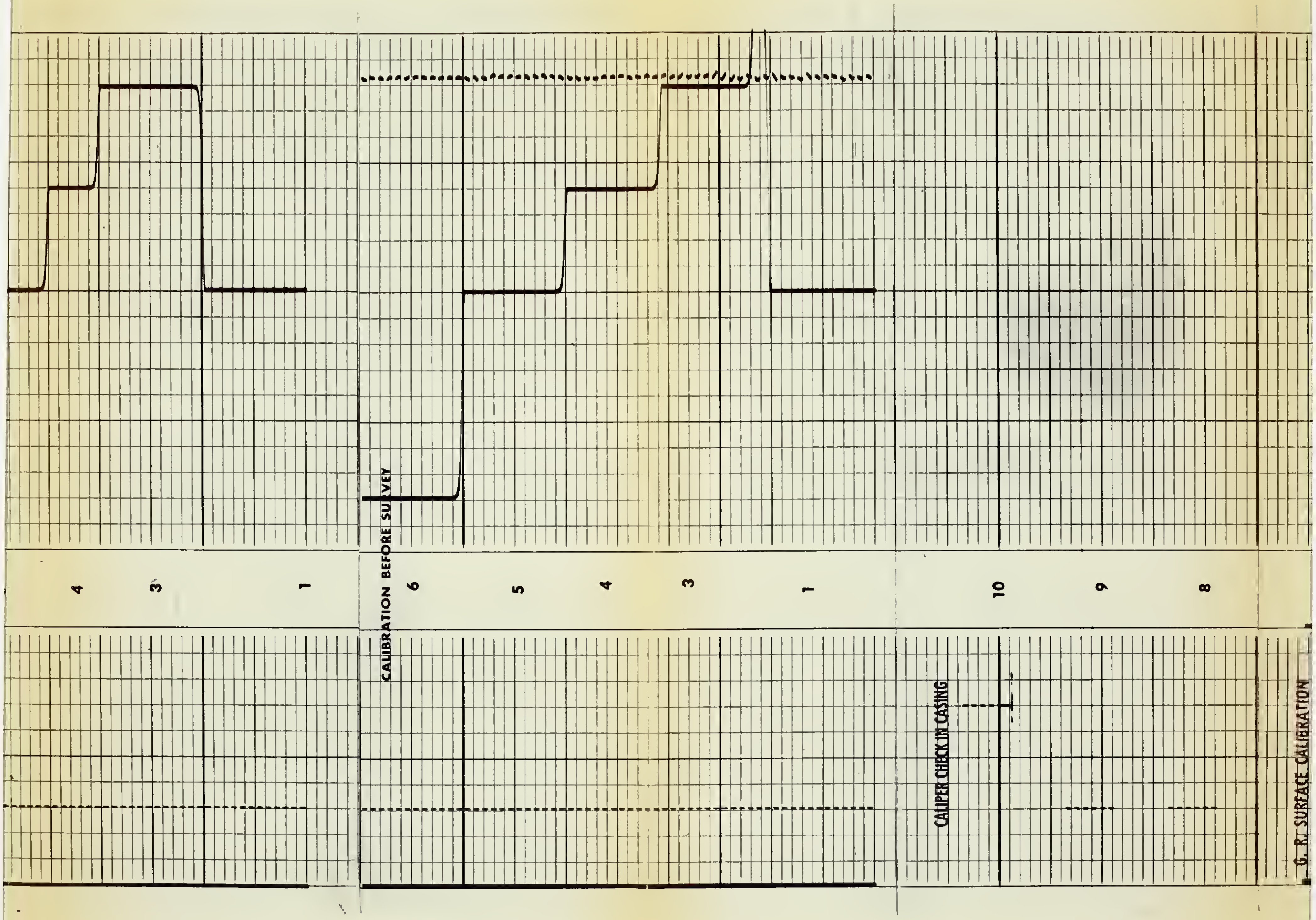
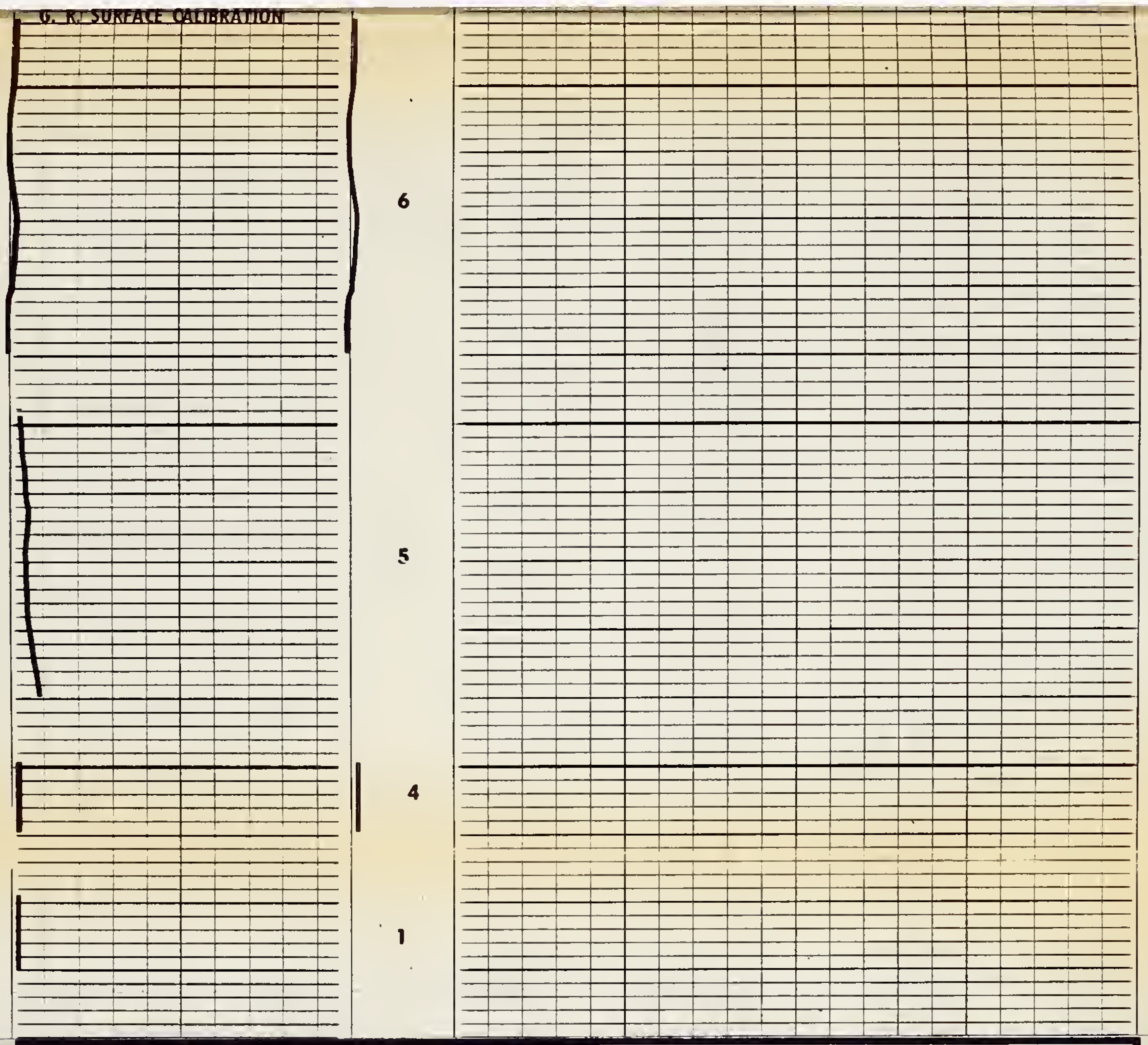

2200
2300
2400


LINE WEIGHT
ΔT
2500
Caliper
GR
GR FR


REPEAT SECTION
MEMORIZER OUT — CURVES INVALID


WEIGHT LINE
INTERVAL TRANSIT TIME
MICROSECONDS PER FOOT
T 3 R1 2 R2
150 100 50
250 200 150
DEPTH
2400
2500
GAMMA RAY
API UNITS
0 150
150 300
CALIPER
DIAM. IN INCHES
5 15
OR FR
CALIBRATION RECORD
CALIBRATION AFTER SURVEY
6
5


4
3
1
CALIBRATION BEFORE SURVEY
6
5
4
3
1
10
9
8
CALIPER CHECK IN CASING
G. R. SURFACE CALIBRATION



BOREHOLE COMPENSATED SONIC CALIBRATION CODING

1. MECHANICAL ZERO
2. 40 μ SEC/FT
3. 60 μ SEC/FT
4. 80 μ SEC/FT
5. 100 μ SEC/FT
6. 140 μ SEC/FT

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATION

CALIBRATION RECORD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #1

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2510
SCHL. TD 2522
DRLR TD 2525

Elev: KB 6436.5
DF 6435.5
GL 6428

SG-1

Schlumberger

AMPLITUDE VARIABLE DENSITY

SONIC LOG - GAMMA RAY

(WITH CALIPER)

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH NO. 1
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH NO. 1

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

Location: API Serial No.
1946' FEL & 1314' FSL
Sec. 2 Twp. 3S Rge. 97W

Other Services:
LL-7
BHC-GR
FDC-GR

Permanent Datum: GL ; Elev.: 6428
Log Measured From GL , 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. 6436.5
D.F. 6435.5
G.L. 6428

Date	12-7-74			
Run No.	ONE			
Depth—Driller	2525			
Depth—Logger	2522			
Btm. Log Interval	2510			
Top Log Interval	154			
Casing—Driller	8 5/8@154	@	@	@
Casing—Logger	154			
Bit Size	6-3/4			
Type Fluid in Hole	FRESH WATER			
Fluid Level	FULL			
Dens. | Visc.	8.0 |	|	|	|
pH | Fluid Loss	- | ml	| ml	| ml	| ml
Source of Sample	CIRCULATED			
R_m @ Meas. Temp.	3.9 @64 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
Source: R_{mf} | R_{mc}	- |	|	|	|
R_m @ BHT	2.2 @119 °F	@ °F	@ °F	@ °F
Time Since Circ.	7 HOURS			
Max. Rec. Temp.	119 °F	°F	°F	°F
Equip. | Location	7683 | VRNL	|	|	|
Recorded By	YATCHAK/ETTER			
Witnessed By	BURNS			

SWS-1383-H

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.		
Depth - Driller		
Type Fluid in Hole		
Dens. | Visc.		
ph | Fluid Loss	ml	ml
Source of Sample		
R_m @ Meas. Temp.	@ °F	@ °F
R_{mf} @ Meas. Temp.	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F
Source: R_{mf} | R_{mc}		
R_m @ BHT	@ °F	@ °F
R_{mf} @ BHT	@ °F	@ °F
R_{mc} @ BHT	@ °F	@ °F

EQUIPMENT DATA

Run No.	ONE
Sonic Panel No.	110
Sonic Cart No.	136
Sonic Sonde No.	163
Mem. Panel No.	166
G.R. Cart. No.	204
G.R. Panel No.	166
Caliper No	929
TTR No.	-
Cent. Device	YES
Stand off - Inches	3/4 & BOWSPRING + VCD
Time Const. - Sec.	2
Speed - F.P.M.	30

REMARKS

Service Order No. - 6929
T_O = 100
T_X = 1
CART GAIN = 1/20
5' SPACING - AMP & VDL
SIGNAL LEVEL VERY LOW AND AMPLITUDE
JUMPING FROM E_Z DETECTION
RECORDER CUT-OFF MZ OF AMP.
GR CAL. ON BHC LOG

CALIBRATION DATA

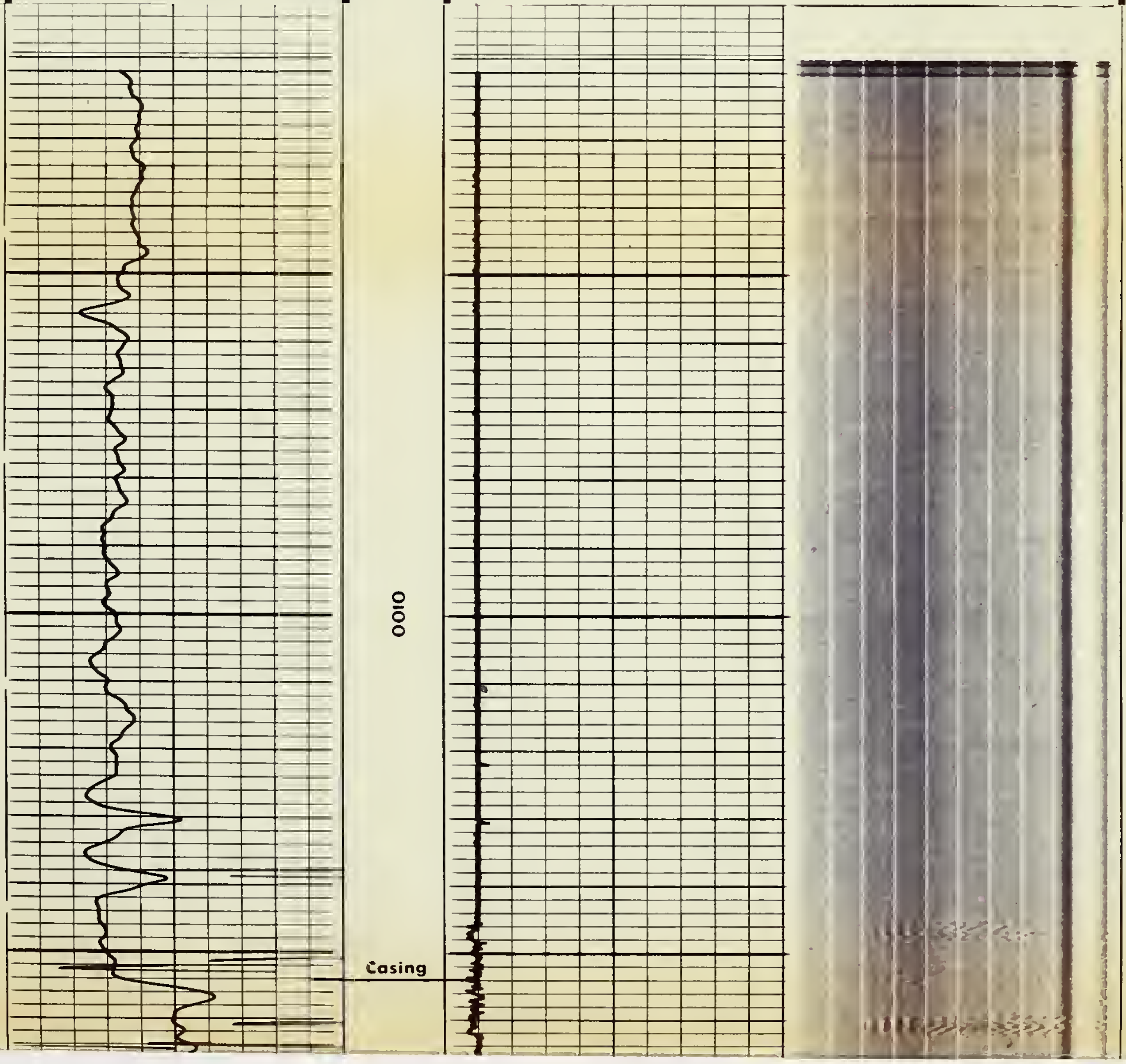
CALIBRATION:	BACKGND. CPS.	SOURCE CPS.	GALV. INCR. DIVISION	SENS. TAP (FOR CAL.)	SENS. TAP (RECORD)	TIME CONST.
GAMMA RAY:	70	290	10	0-165	0-150	2

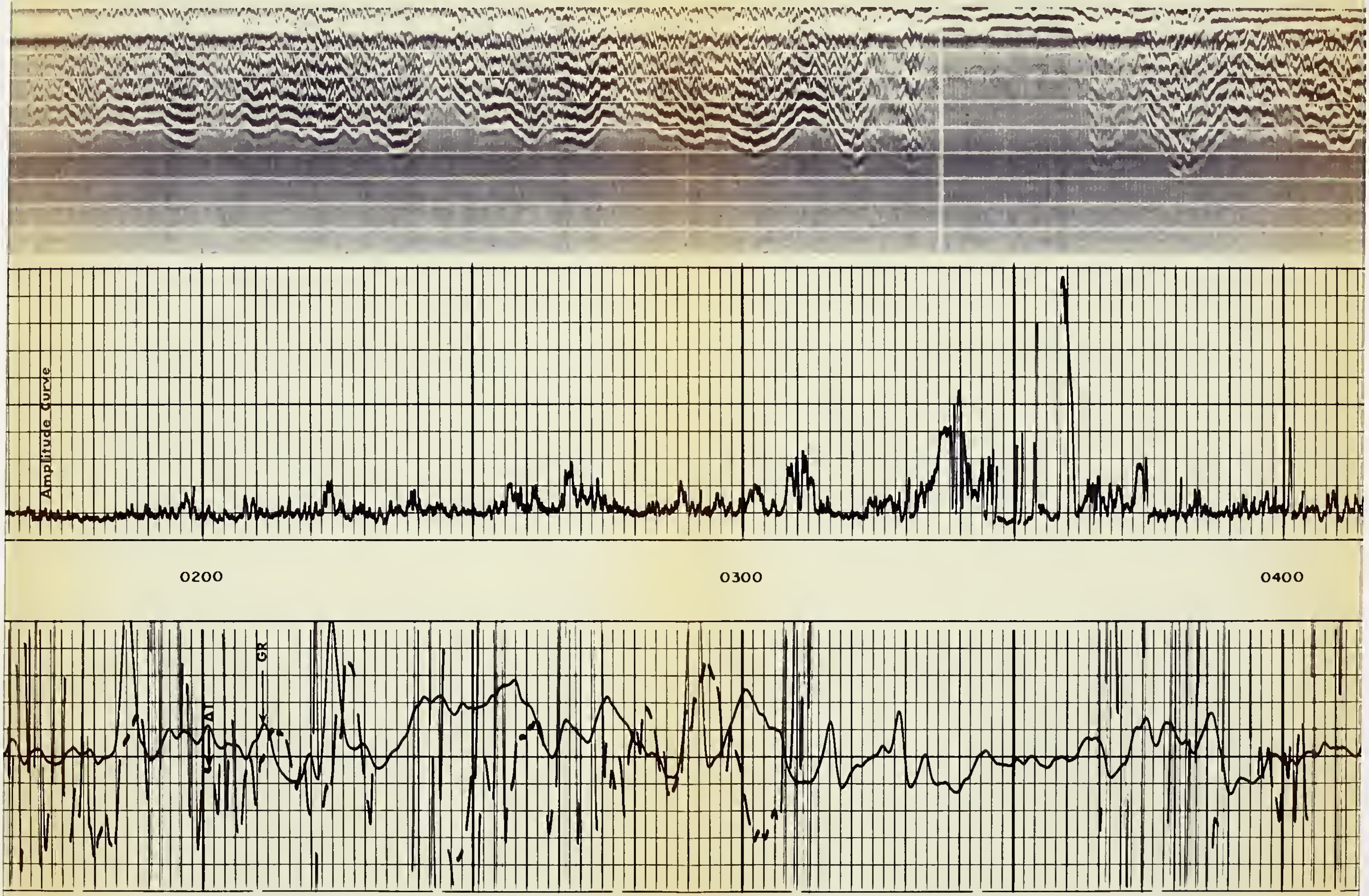
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

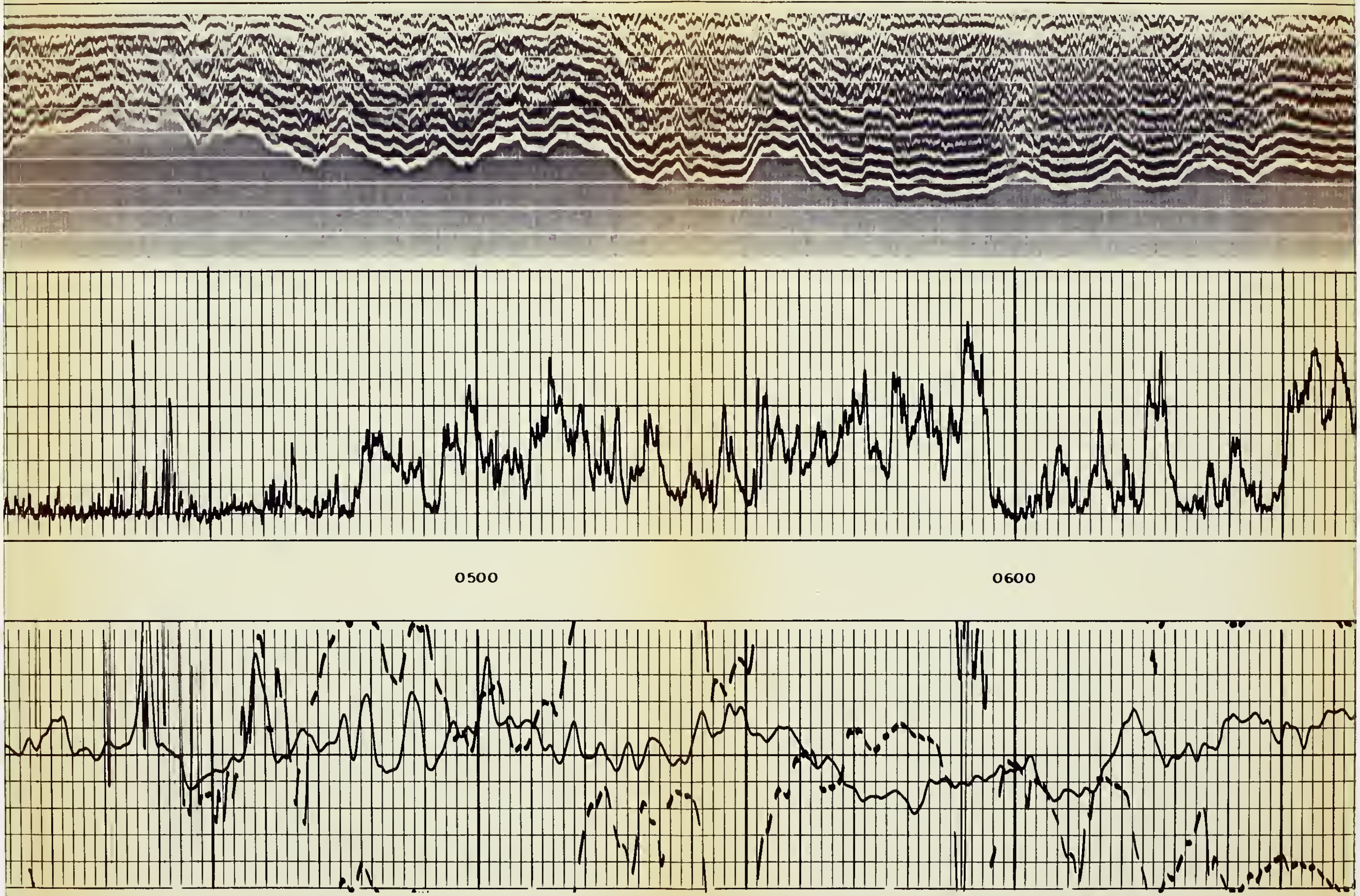
WS-2231

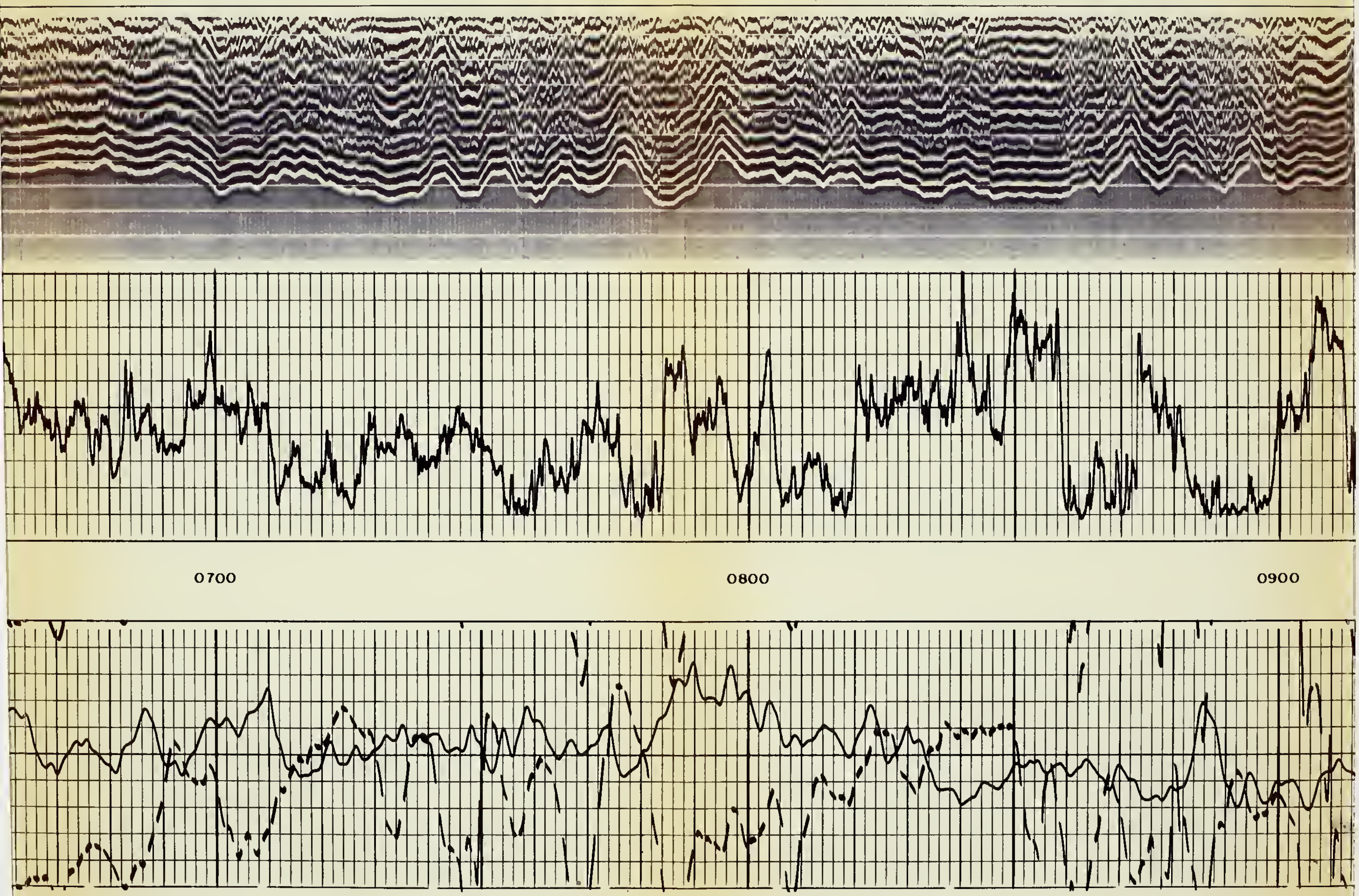
SINGLE RECEIVER ΔT microseconds		AMPLITUDE MILLIVOLTS		VARIABLE DENSITY MICROSECONDS	
600	400	0	20	200	1200
800	600				

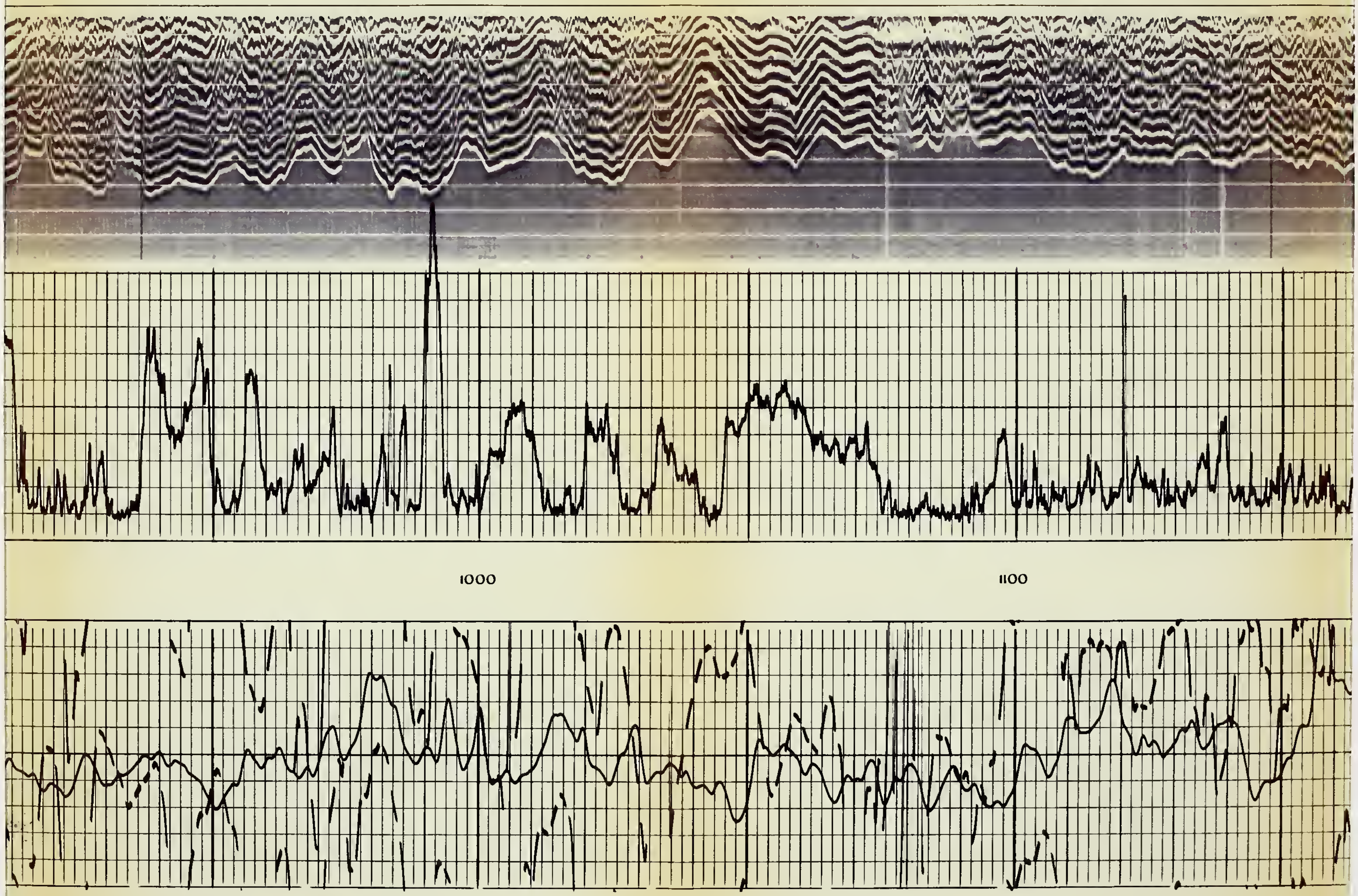
GAMMA RAY API UNITS	
0	150
150	300

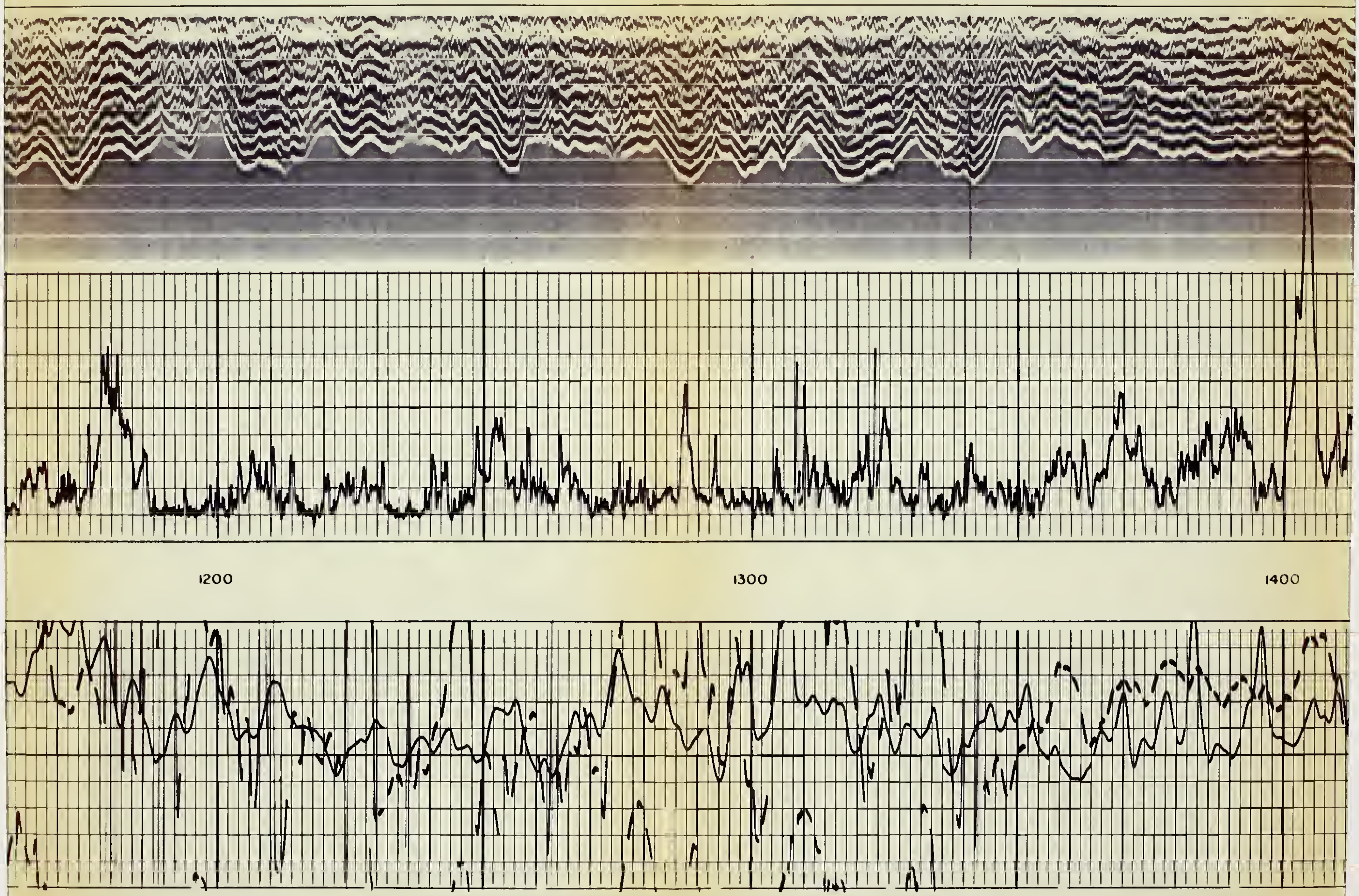


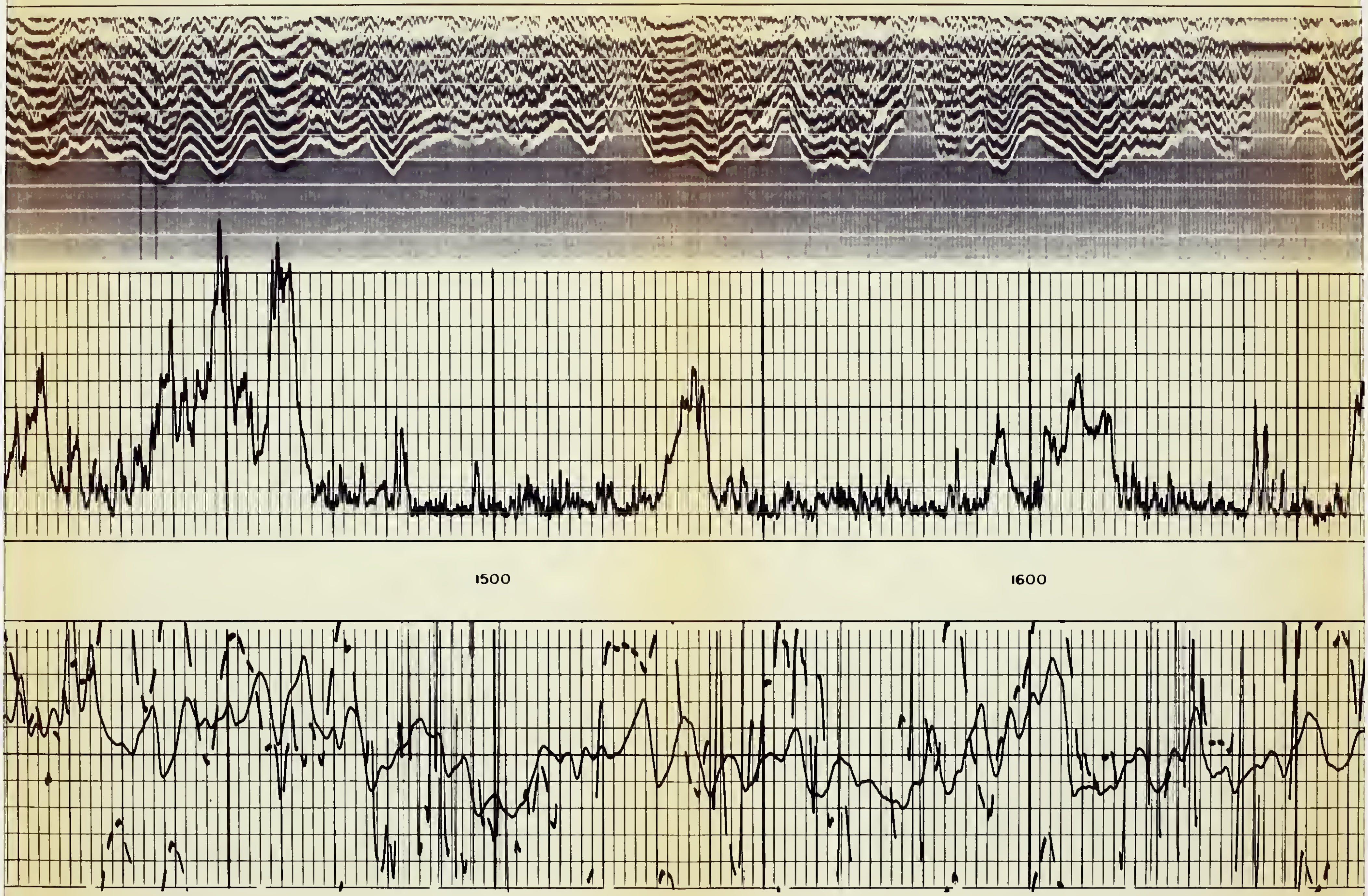

Amplitude Curve
0200
0300
0400
AT
GR

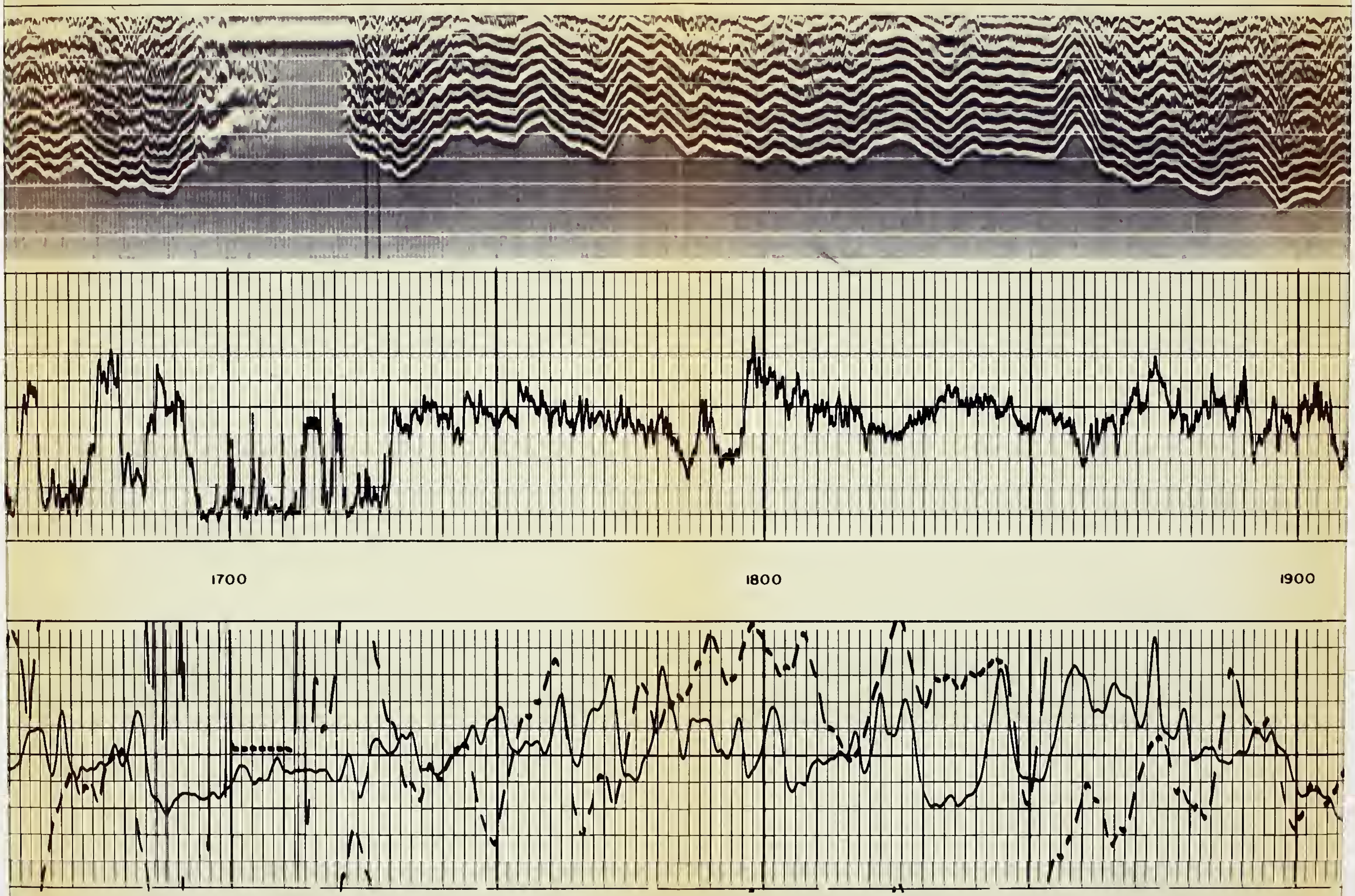

0500
0600

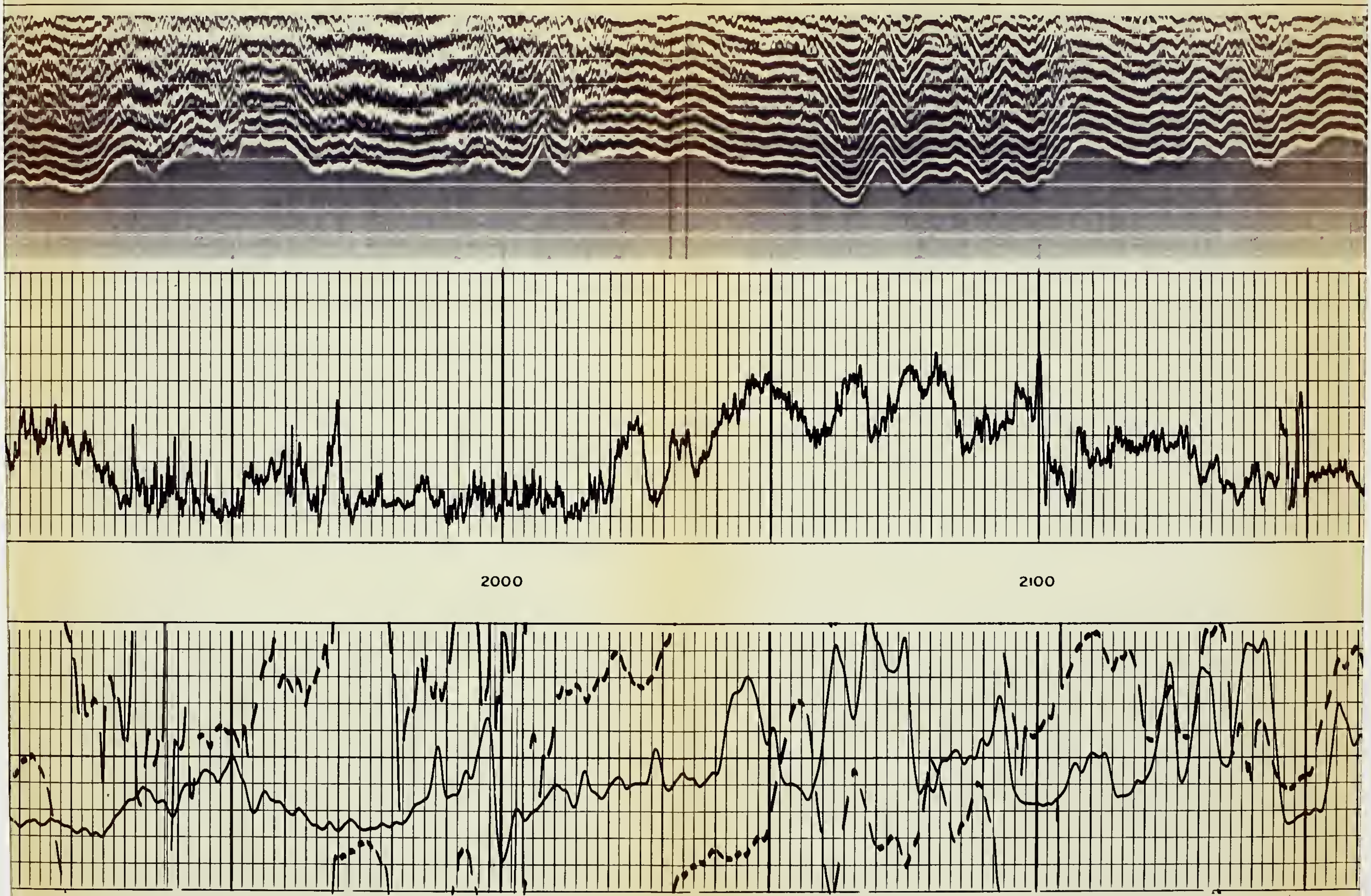

0700
0800
0900

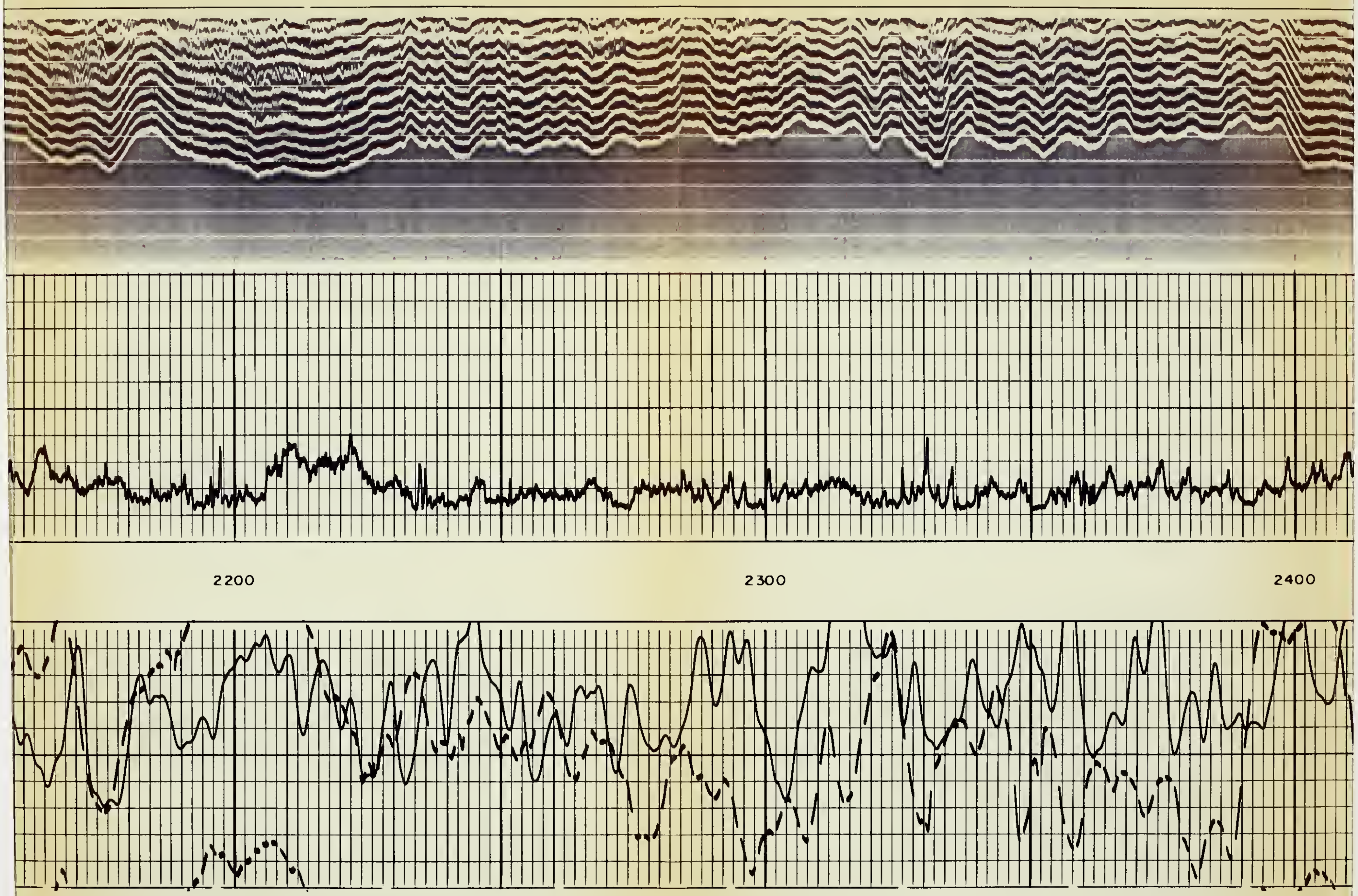

1000
1100

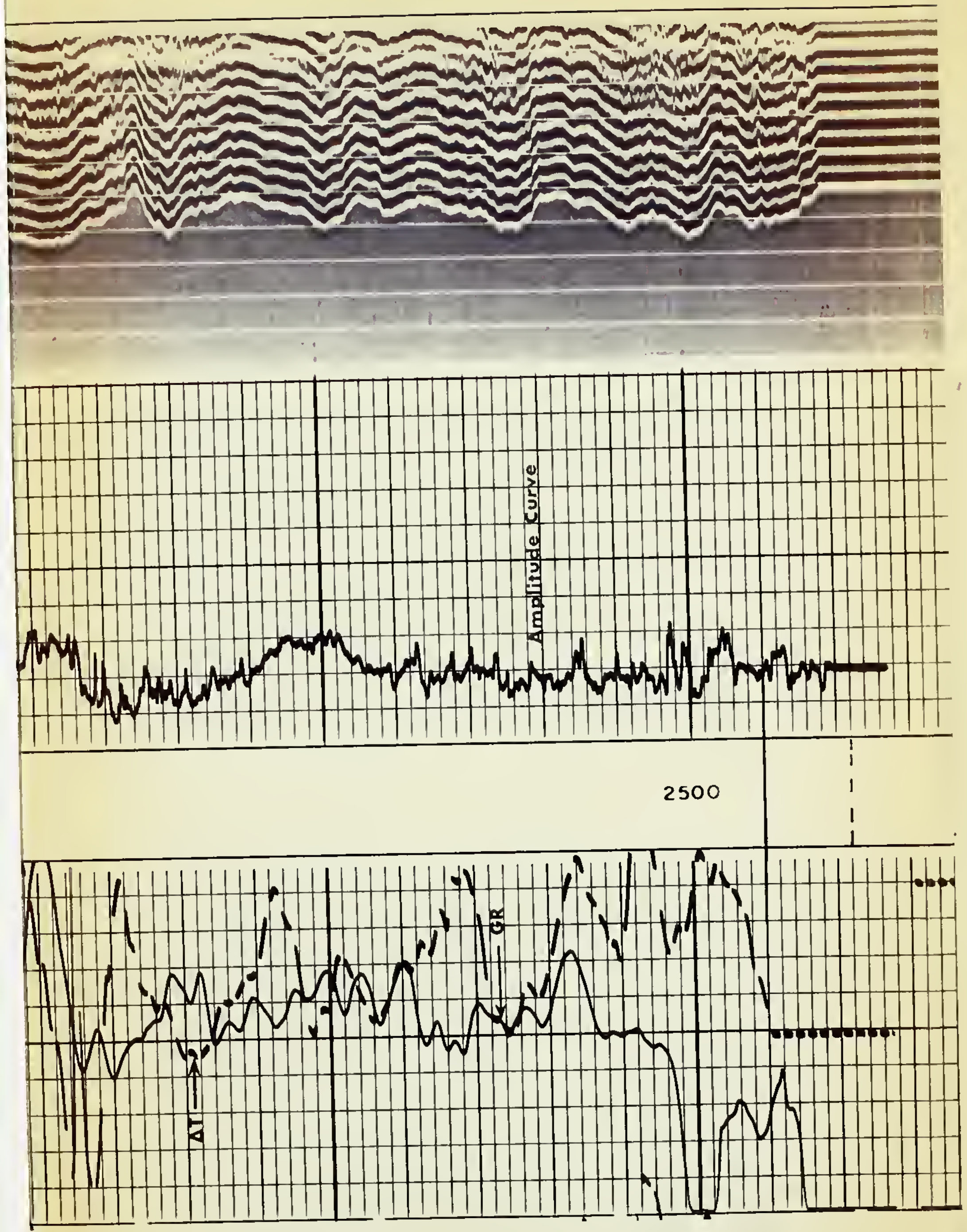

1200
1300
1400

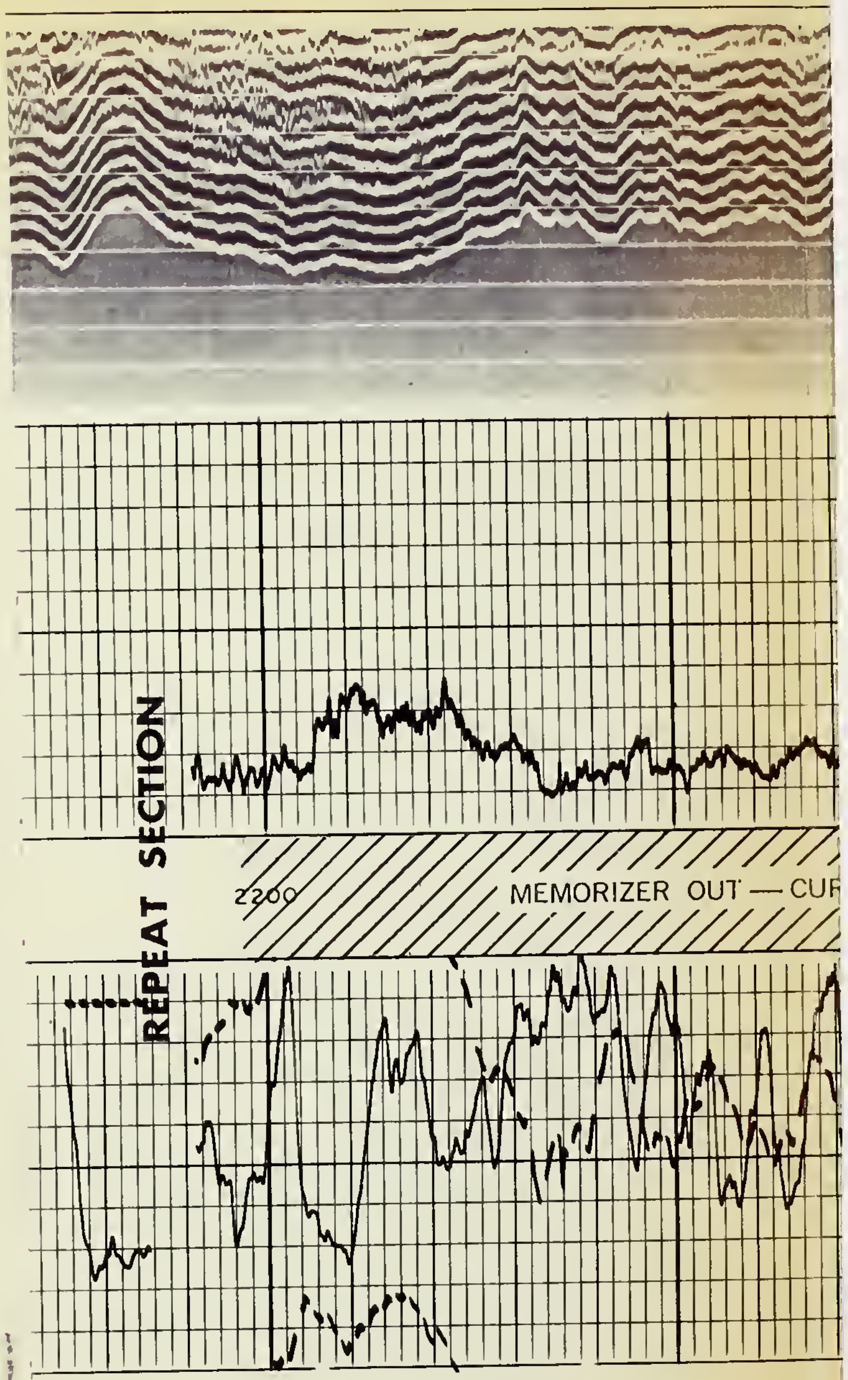

1500
1600

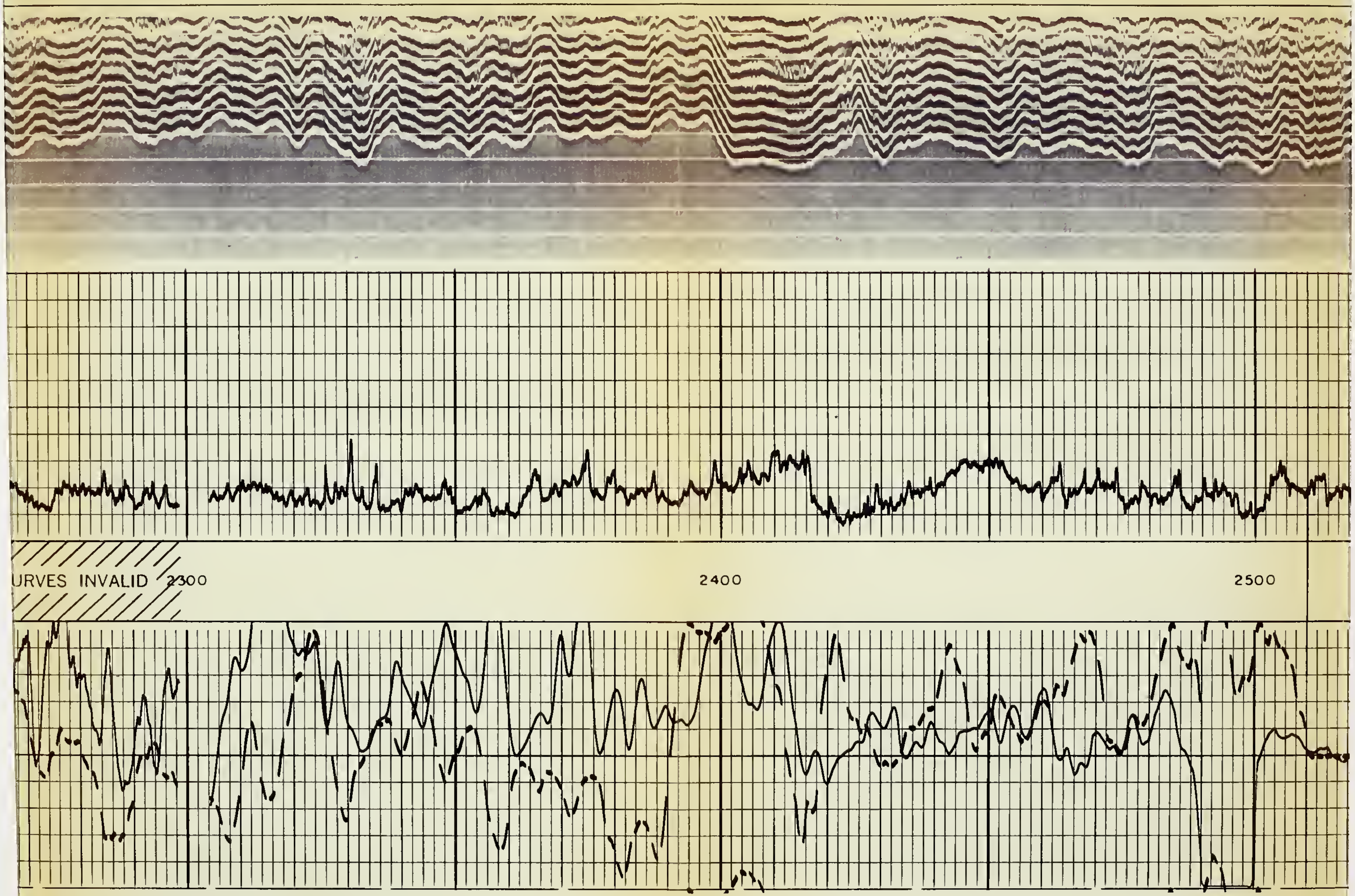

1700
1800
1900

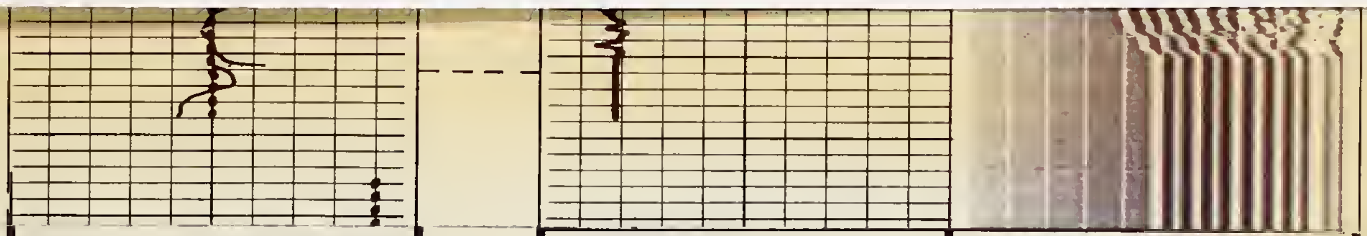

2000
2100


2200
2300
2400


Amplitude Curve
2500
AT
GR


REPEAT SECTION
2200
MEMORIZER OUT — CUR


URVES INVALID
2300
2400
2500



SINGLE RECEIVER ΔT
microseconds

600	400
800	600

GAMMA RAY API UNITS

0	150
150	300

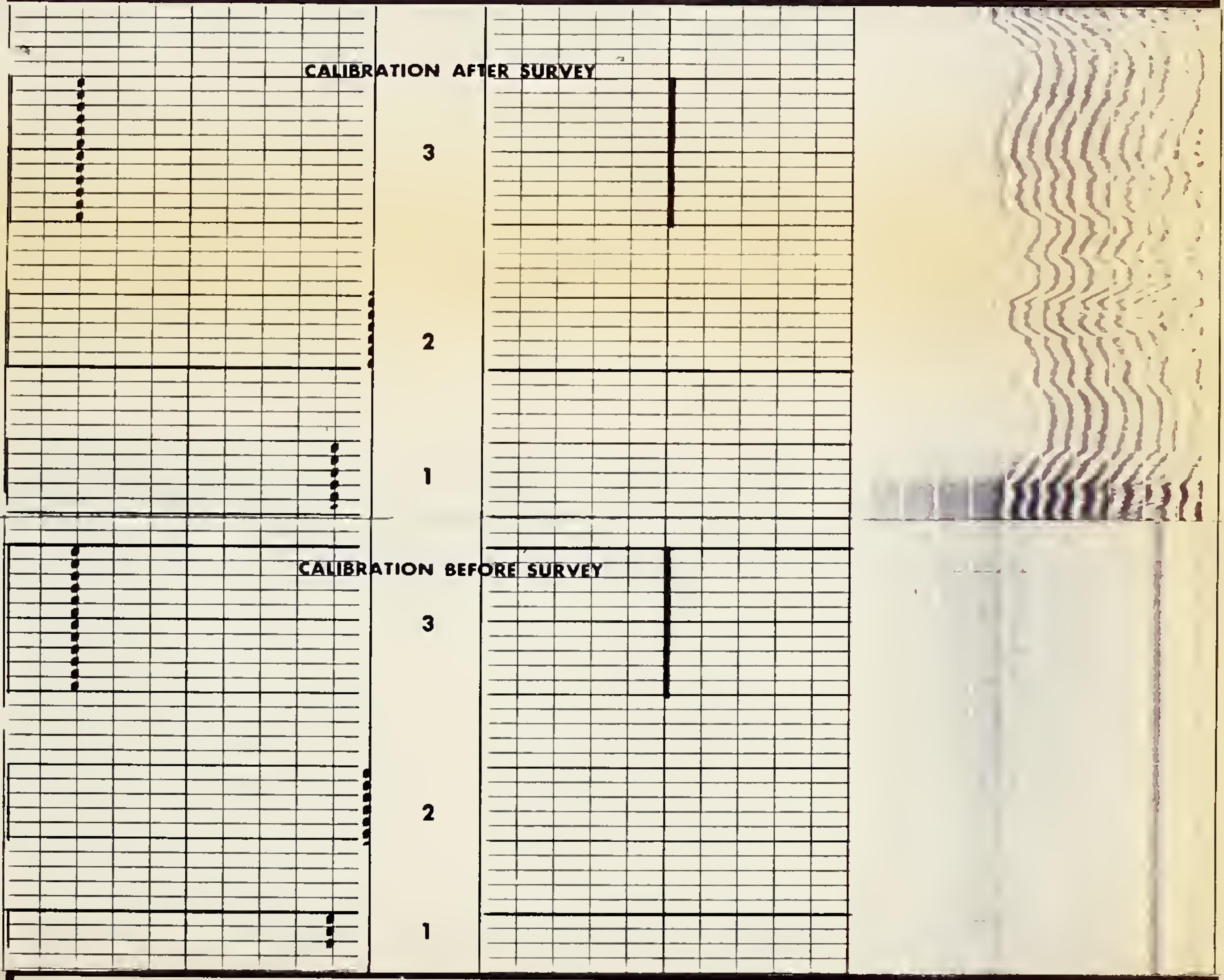
AMPLITUDE MILLIVOLTS

0	20

VARIABLE DENSITY
MICROSECONDS

200	1200

CALIBRATION RECORD



BOREHOLE COMPENSATED SONIC CALIBRATION CODING

1. MECHANICAL ZERO
2. 40 μ SEC/FT
3. 60 μ SEC FT
4. 80 μ SEC/FT
5. 100 μ SEC/FT
6. 140 μ SEC FT

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATION

CALIBRATION RECORD

COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH NO. 1
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2510
SCHL. TD 2522
DRLR TD 2525

Elev: KB 6436.5
DF 6435.5
GL 6428

COREHOLE SG-1

THIS ENVELOPE CONTAINS THE FOLLOWING GEOPHYSICAL LOGS:

1. Schlumberger Formation Density
2. Schlumberger Temperature
3. Schlumberger Dual Laterolog

II B-2206

Schlumberger

DUAL LATEROLOG

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #1
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RIGHFIELD COMPANY

WELL SORGHUM GULCH #1

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION: API Serial No.
1946' FEL & 1314 FSL
Sec. 2 Twp. 3S Rge. 97W

Other Services:
BHC-GR
GR-AMP-VDL
FDC-GR

Permanent Datum: GL, Elev. 6428
Log Measured From GL Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. 6436.5
D.F. 6435.5
G.L. 6428

Date	12-7-74			
Run No.	ONE			
Depth—Driller	2525			
Depth—Logger	2520			
Btm. Log Interval	2508			
Top Log Interval	154			
Casing—Driller	8 5/8 @ 156	@	@	@
Casing—Logger	154			
Bit Size	6-3/4			
Type Fluid in Hole	WATER			
Dens. | Visc.	80 | -			
pH | Fluid Loss	NA | ml	ml	ml	ml
Source of Sample	MUDPIT			
R_m @ Meas. Temp.	3.7 @ 64 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
Source: R_{mf} R_{mc}	CLEAR WATER			
R_m @ BHT	2.2 @ 119 °F	@ °F	@ °F	@ °F
Time Since Circ.	28 HOURS			
Max. Rec. Temp.	119 °F	°F	°F	°F
Equip. | Location	7683 | VRNL			
Recorded By	YATCHAK/ETTER			
Witnessed By	BURNS			

SWS-1974-C

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.		
Depth - Driller		
Type Fluid in Hole		
Dens. | Visc.		
ph | Fluid Loss	ml	ml
Source of Sample		
R_m @ Meas. Temp.	@ °F	@ °F
R_{mf} @ Meas. Temp.	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F
Source: R_{mf} | R_{mc}		
R_m @ BHT	@ °F	@ °F
R_{mf} @ BHT	@ °F	@ °F
R_{mc} @ BHT	@ °F	@ °F

REMARKS SP & LLS TRACED ON LL_D

Service Order No. - 6930
LL_D REPEAT LOST. LLS REPEAT PRESENTED EVEN THOUGH
NOT DASHED.
LL RUN ON .2-2000 RATHER THAN 2-20000 AS HIGHER
SCALE OUTSIDE ITS RANGE OF OPERATION.

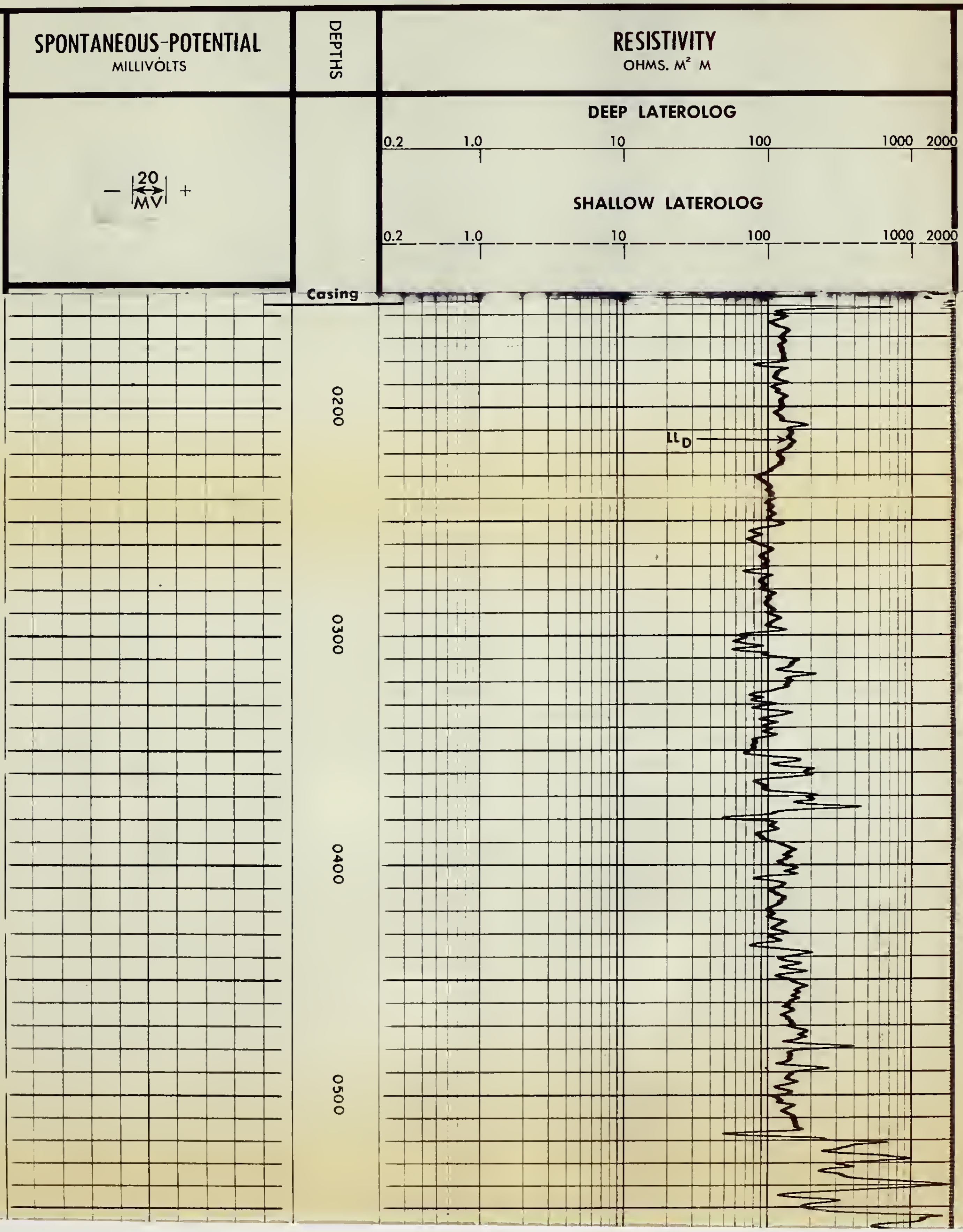
EQUIPMENT DATA

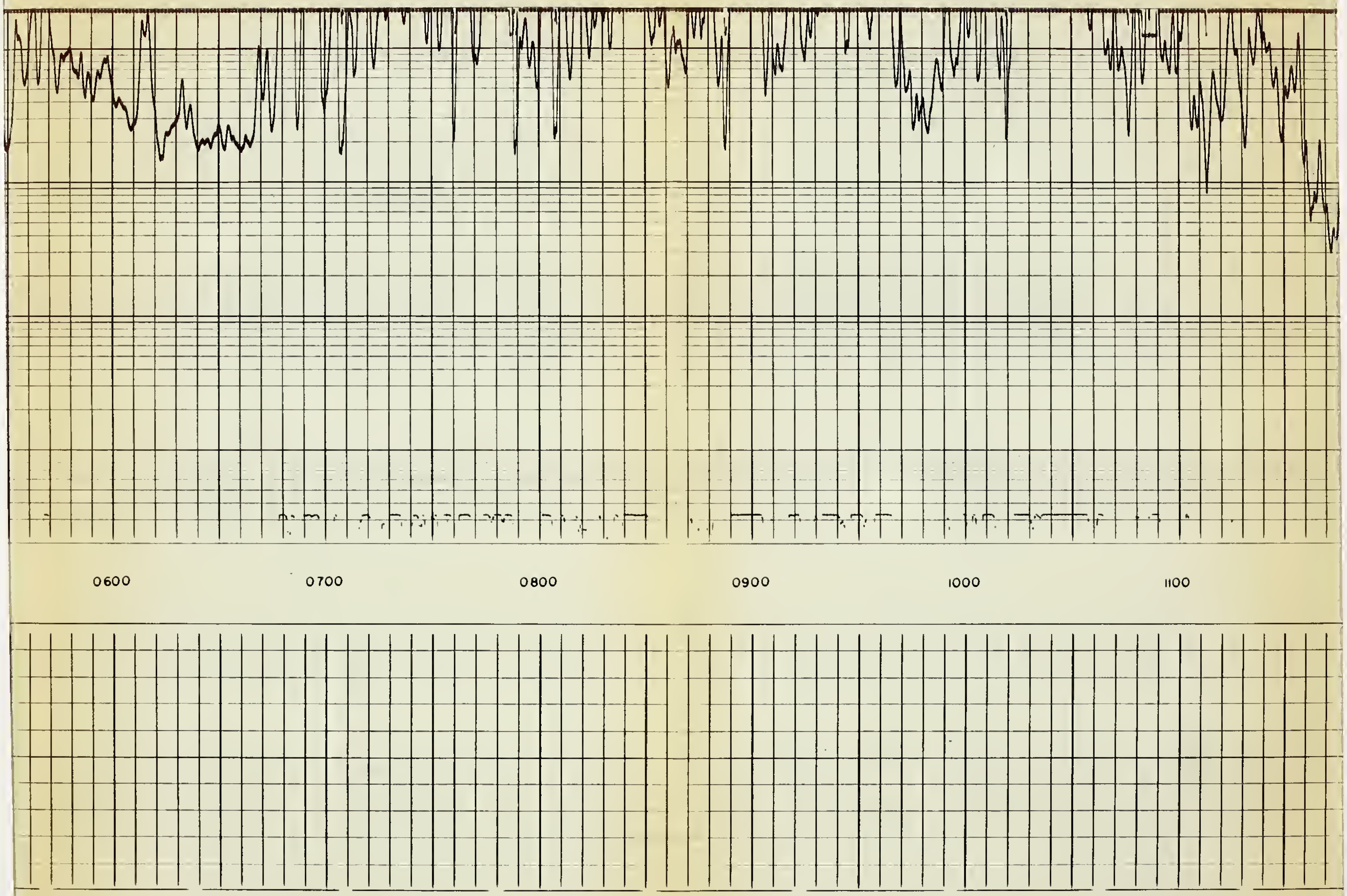
Run No.	ONE
Panel No.	83
Cart. No.	87
Sonde No.	92
Mem. Panel No.	-
G.R. Cart. No.	-
G.R. Panel No.	-
TTR No.	-
Speed-F.P.M.	70

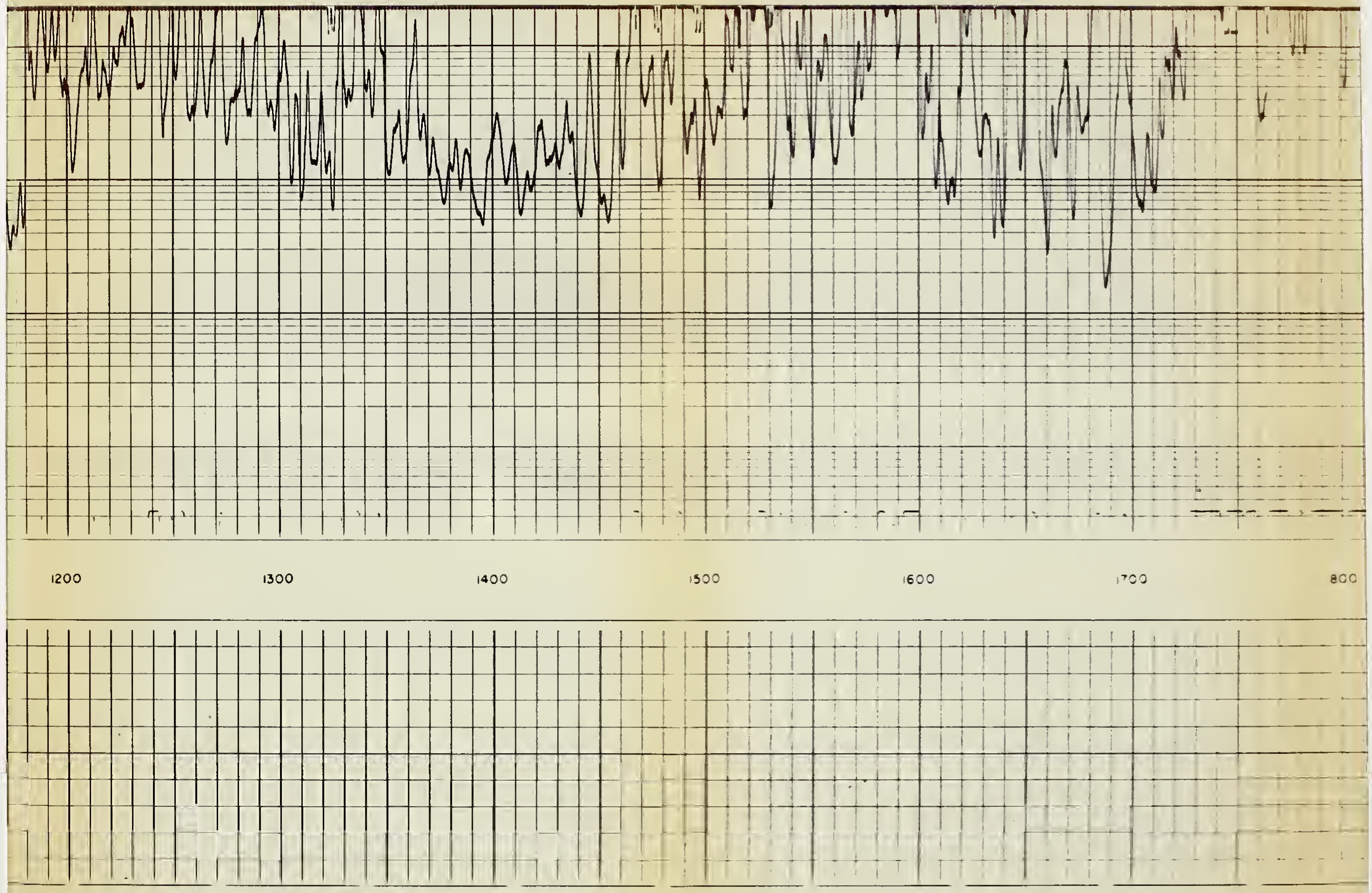
CALIBRATION DATA

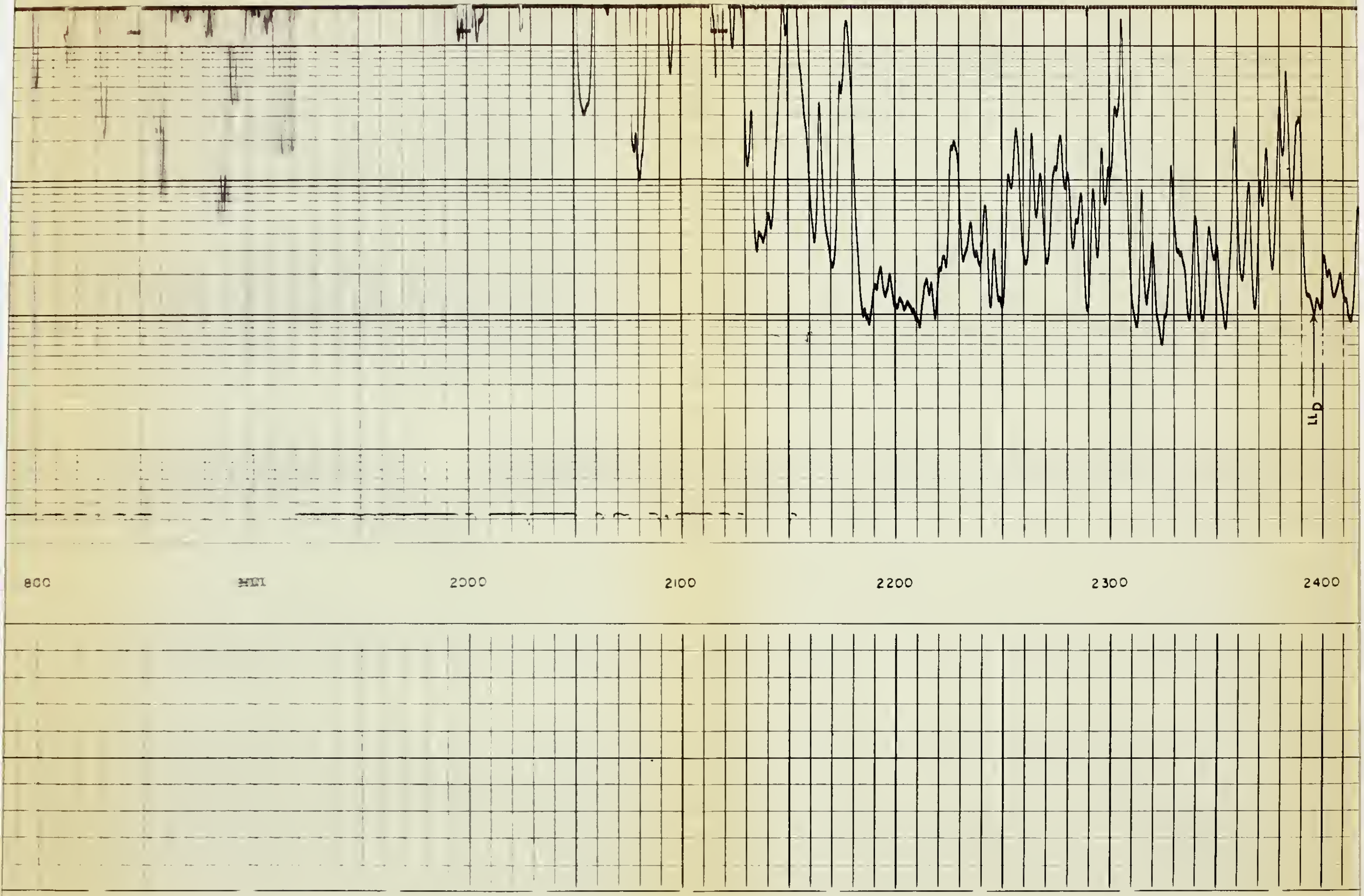
CALIBRATION:	BACKGND. CPS.	SOURCE CPS.	GALV. INCR. DIVISION	SENS. TAP (FOR CAL.)	SENS. TAP (RECORD)	TIME CONST.
GAMMA RAY:						

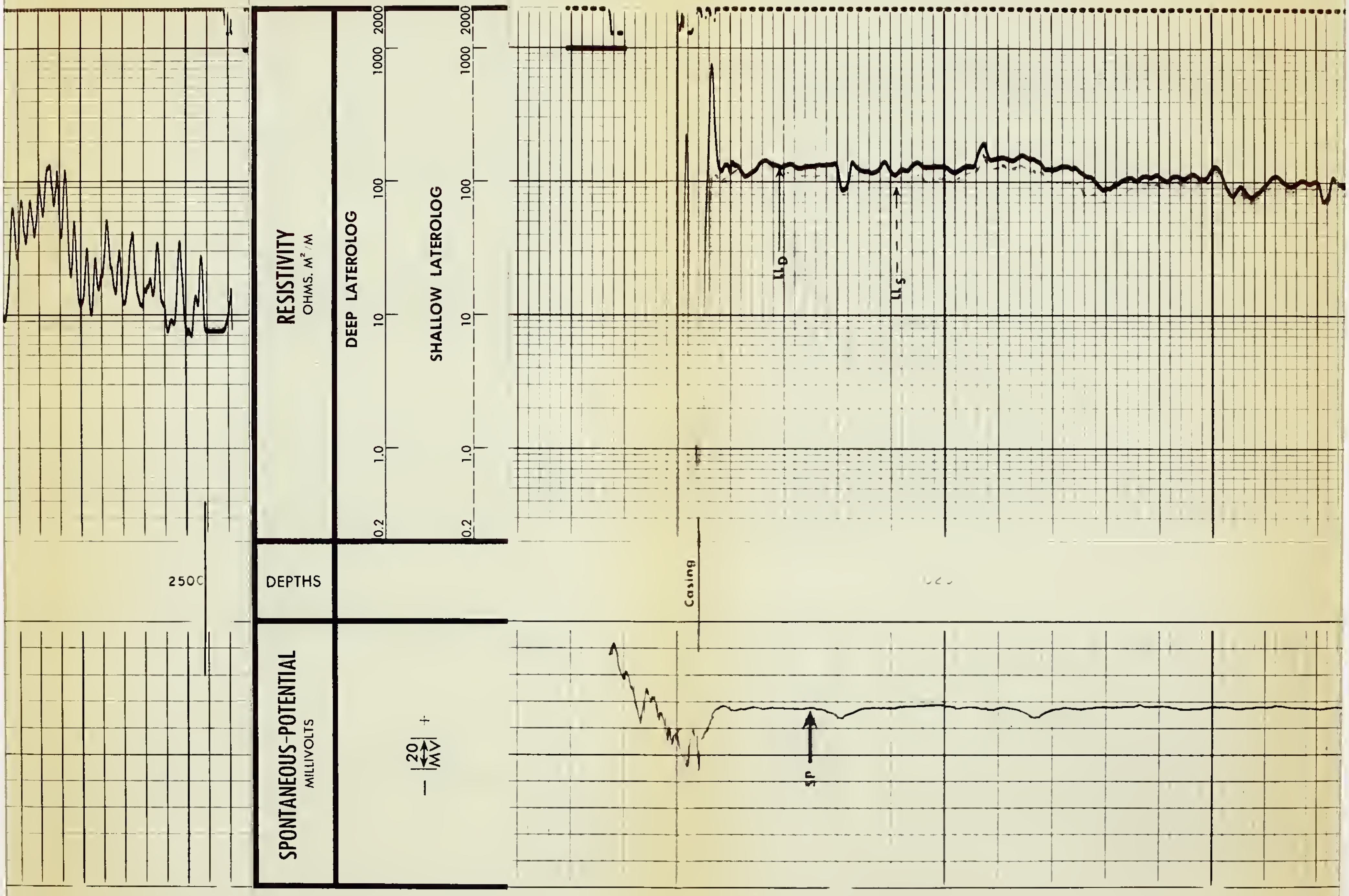
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

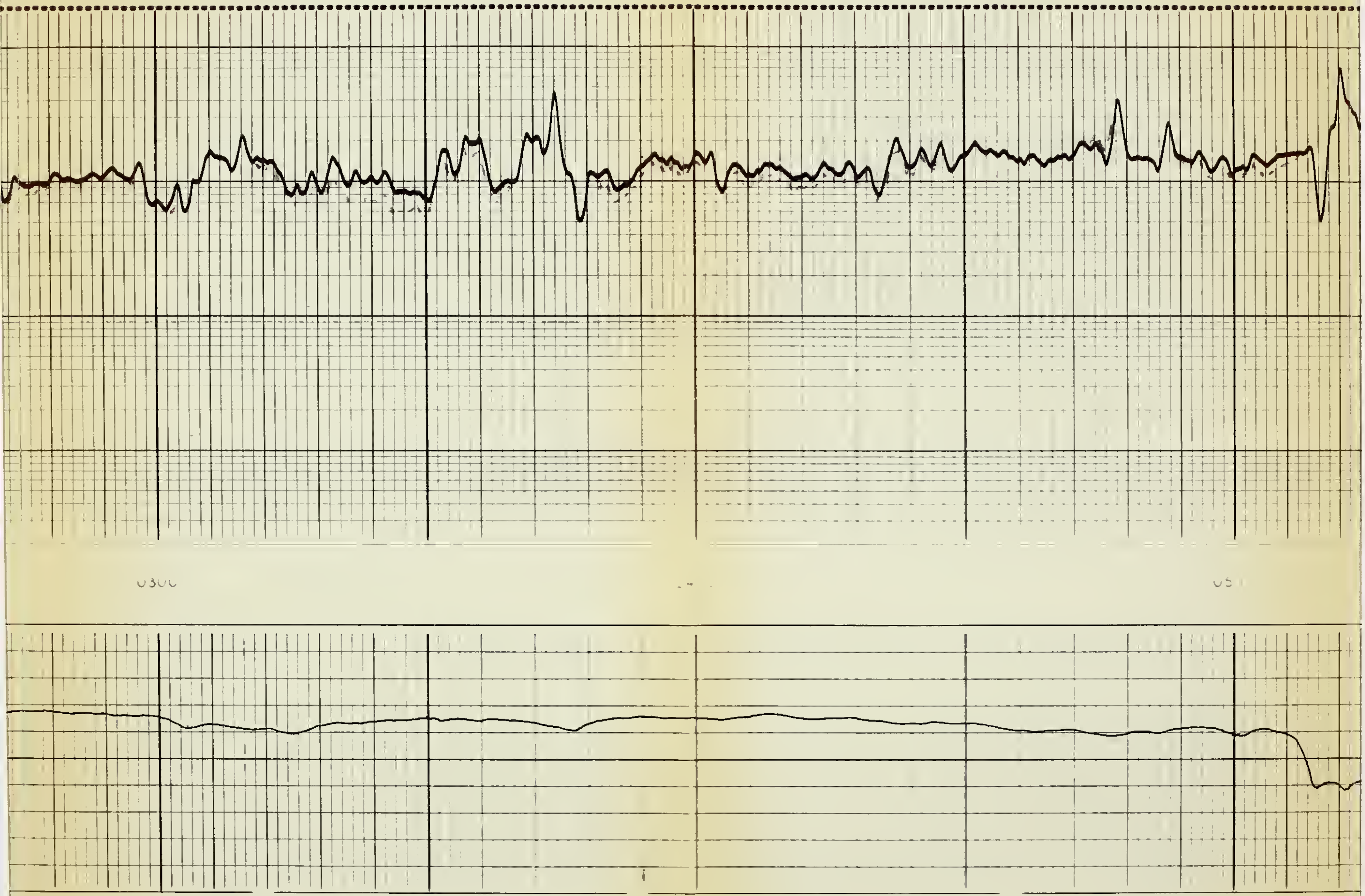


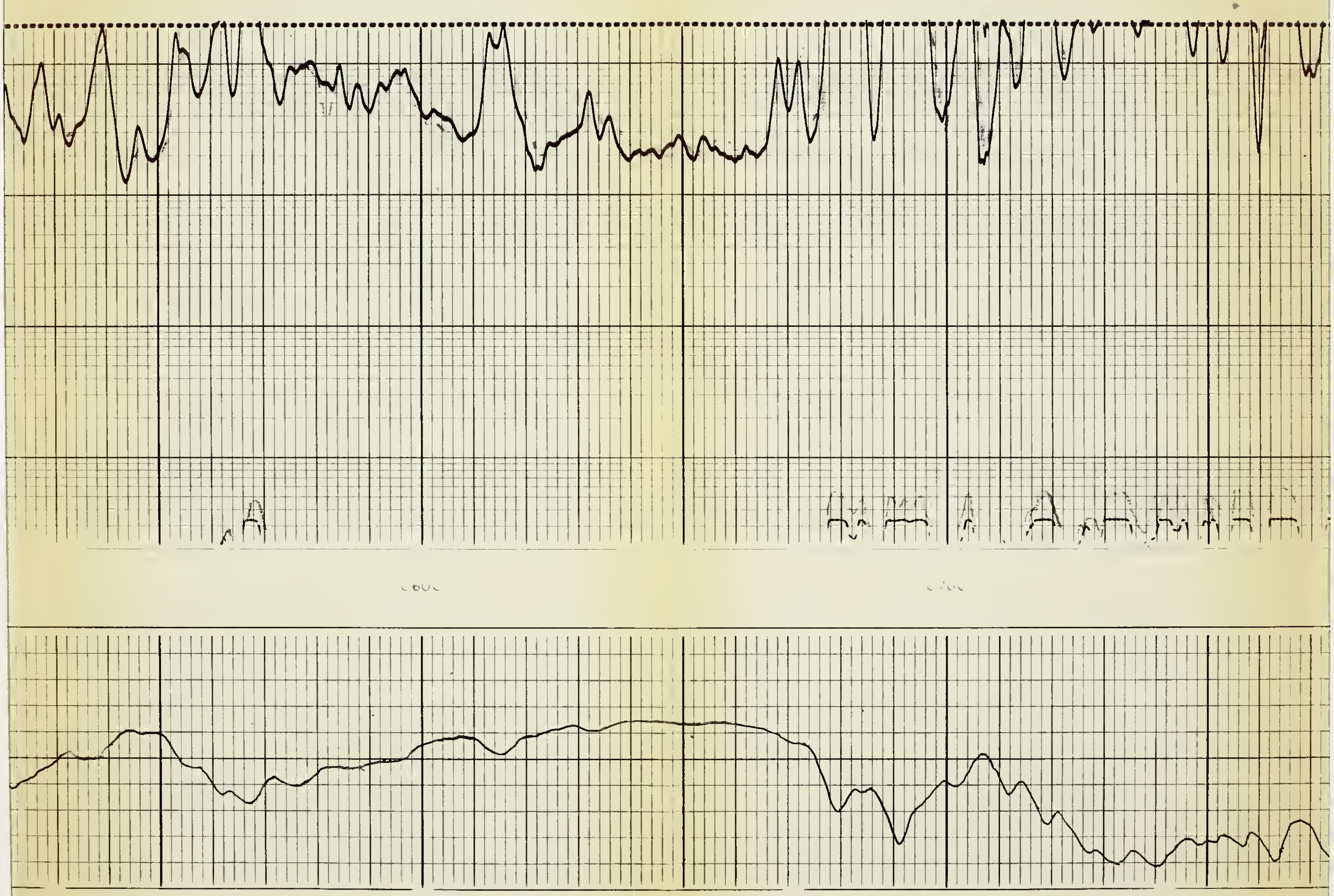

0600
0700
0800
0900
1000
1100

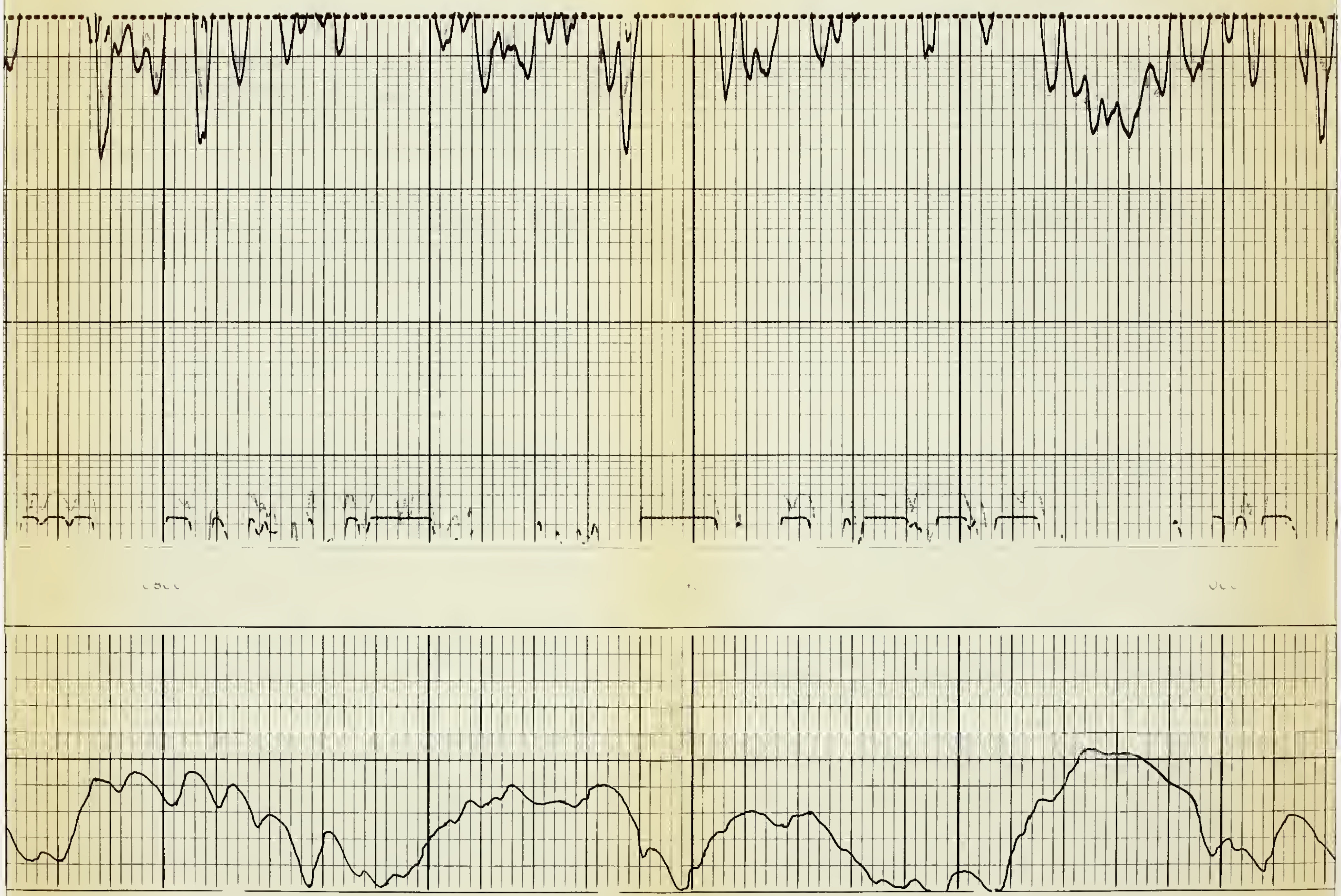

1200
1300
1400
1500
1600
1700
800

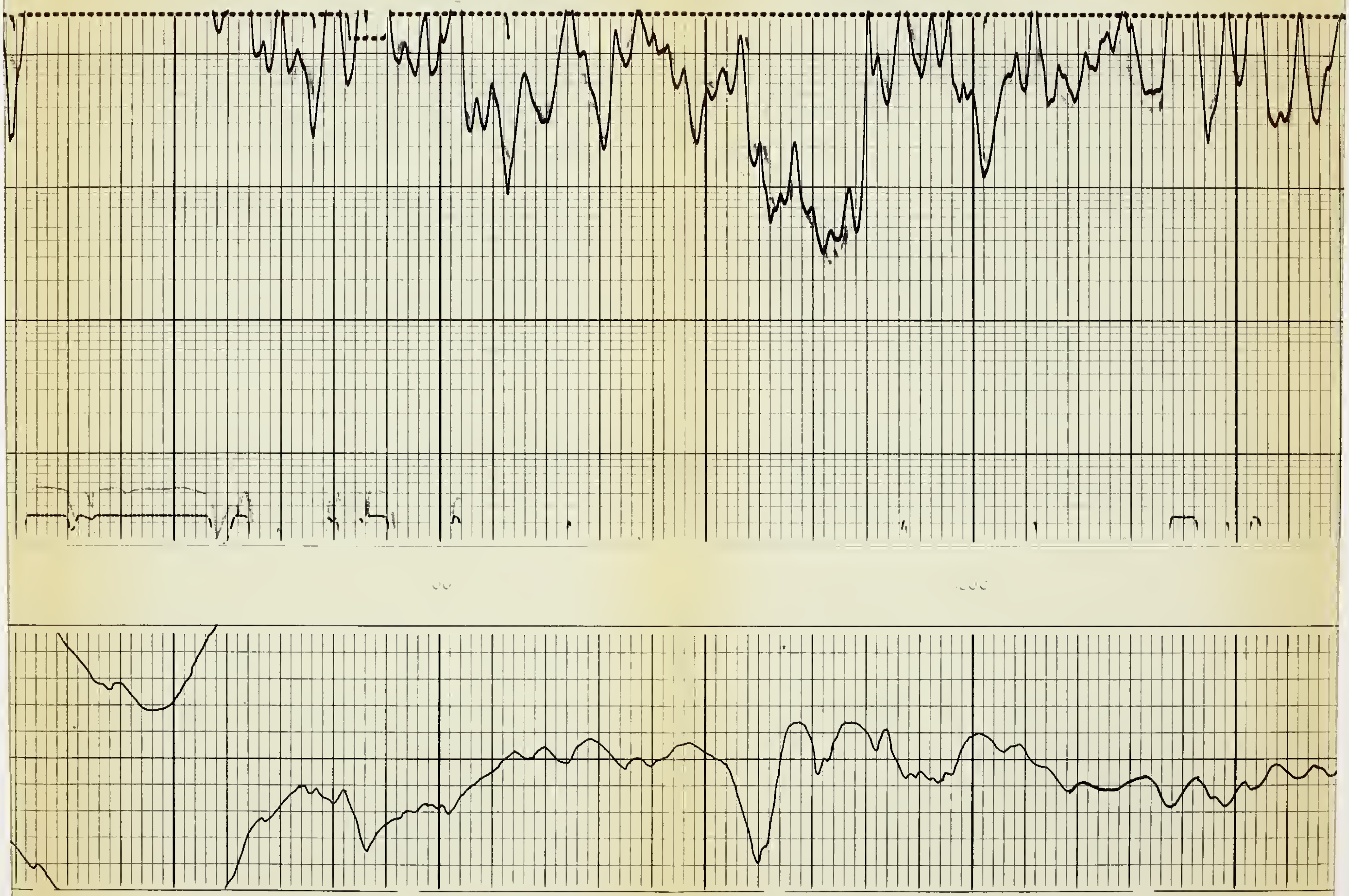

LLD
800
2000
2100
2200
2300
2400

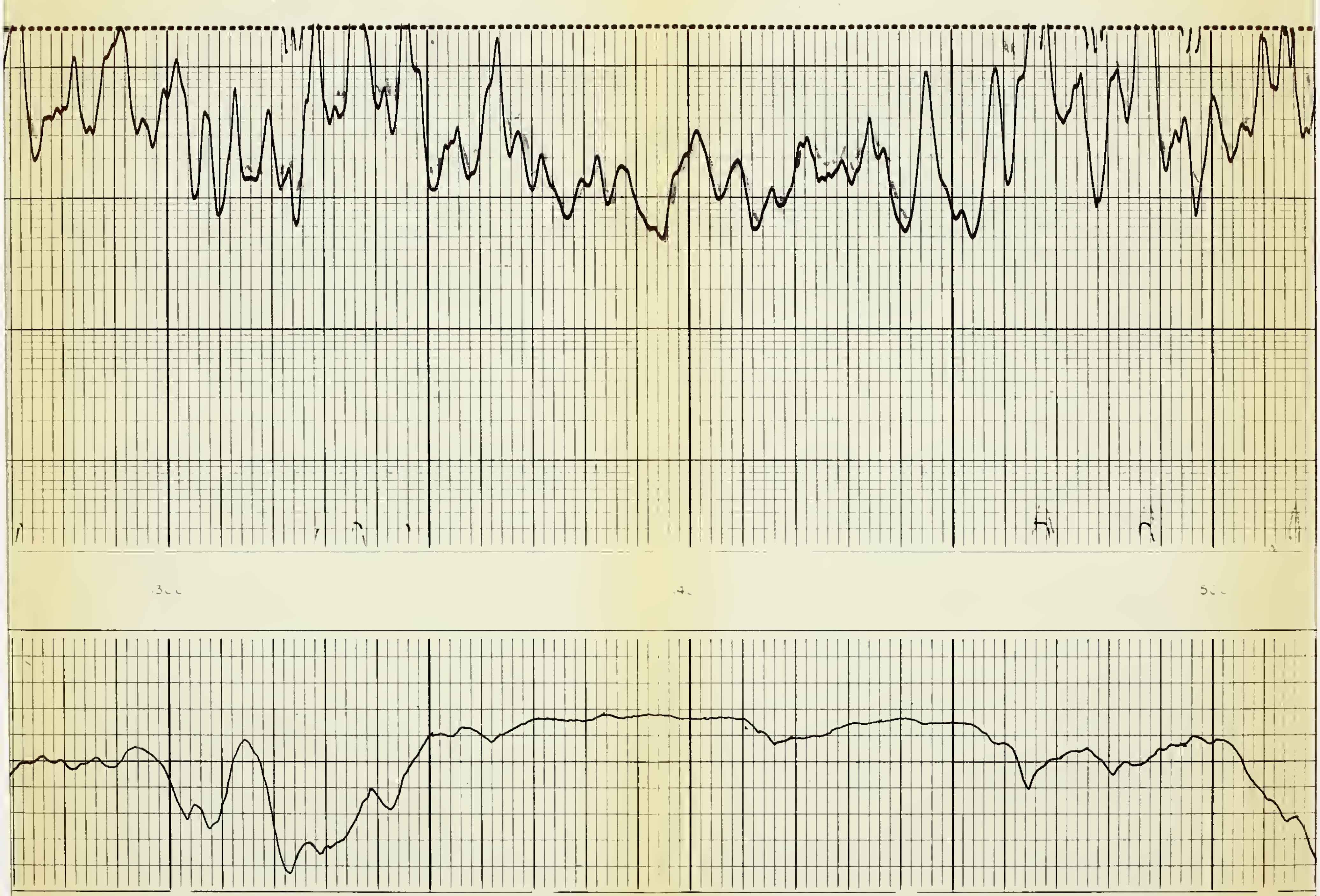

RESISTIVITY
OHMS. M²/M
DEEP LATEROLOG
0.2 1.0 10 100 1000 2000
SHALLOW LATEROLOG
0.2 1.0 10 100 1000 2000
LLD
LLS
DEPTHS
2500
Casing
SPONTANEOUS-POTENTIAL
MILLIVOLTS
− 20 MV +
SP

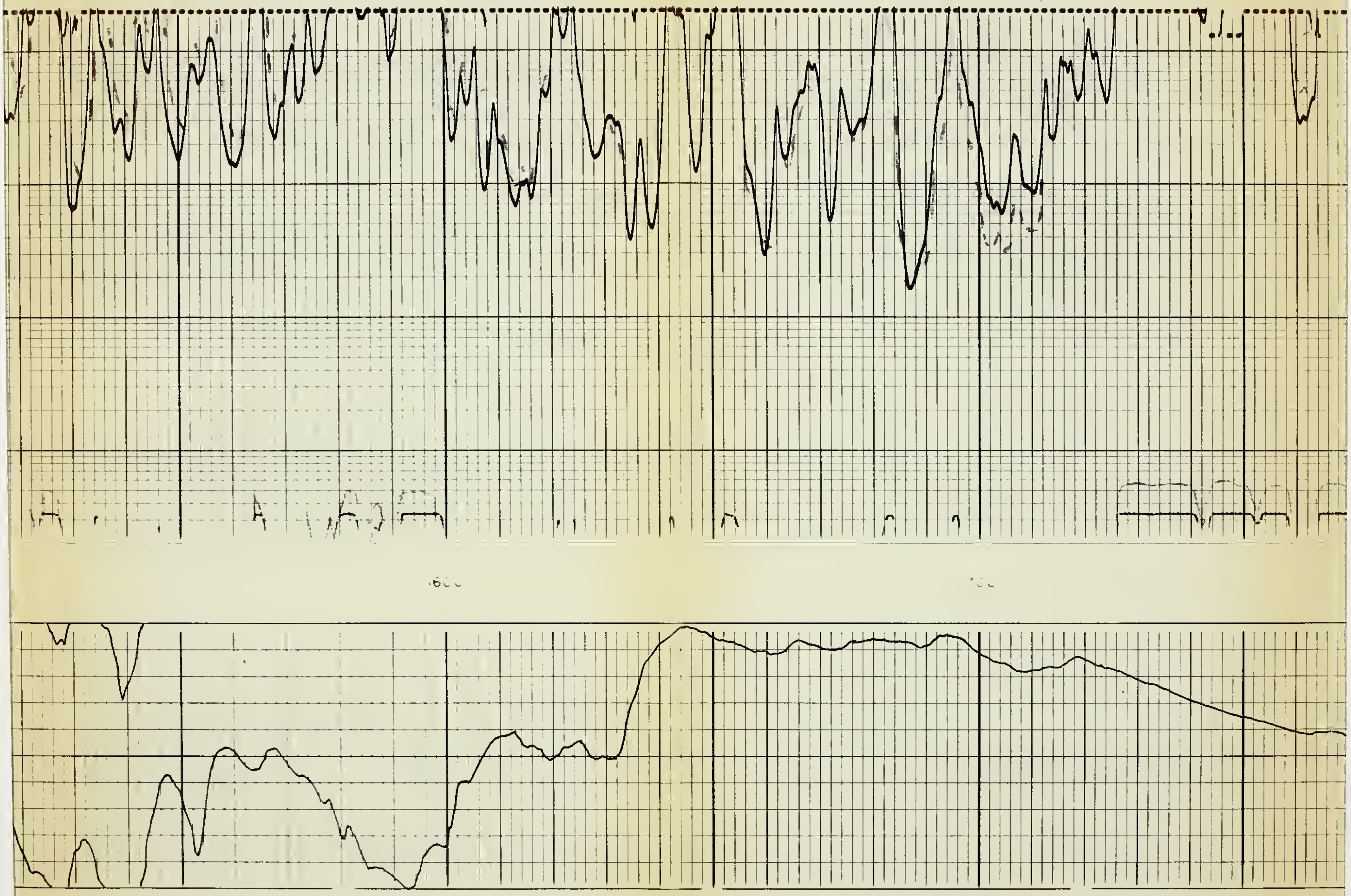

0300

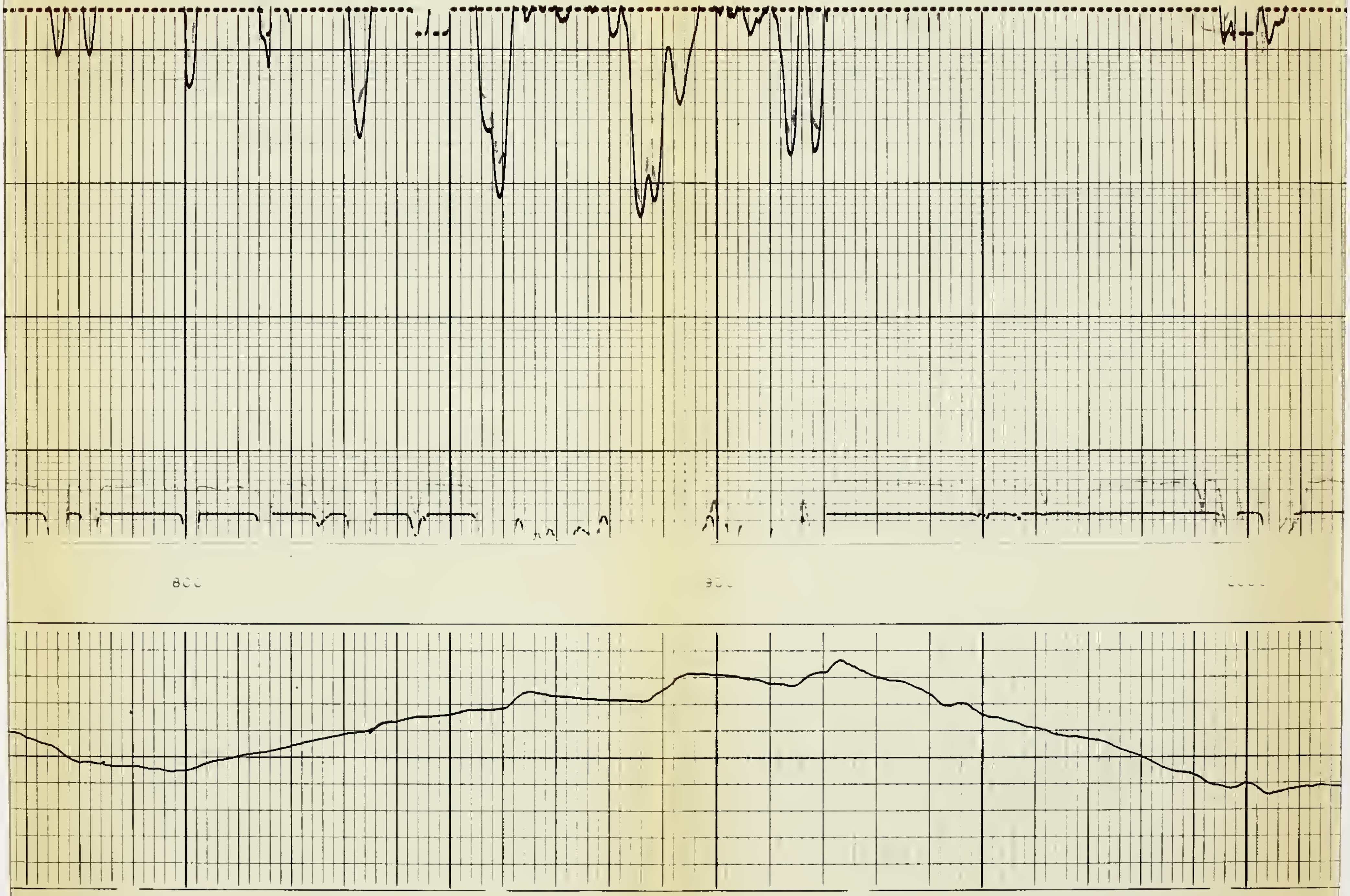


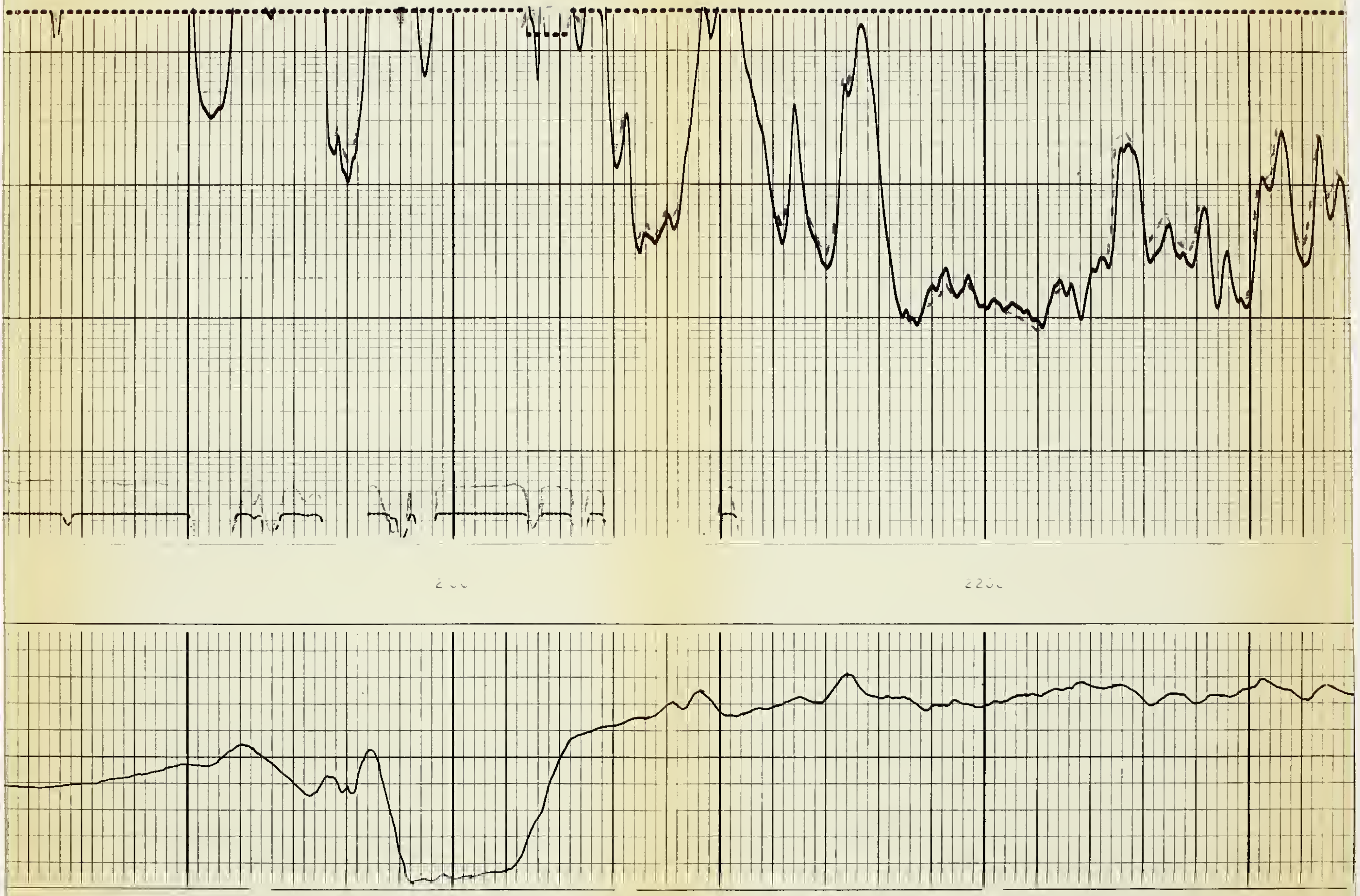


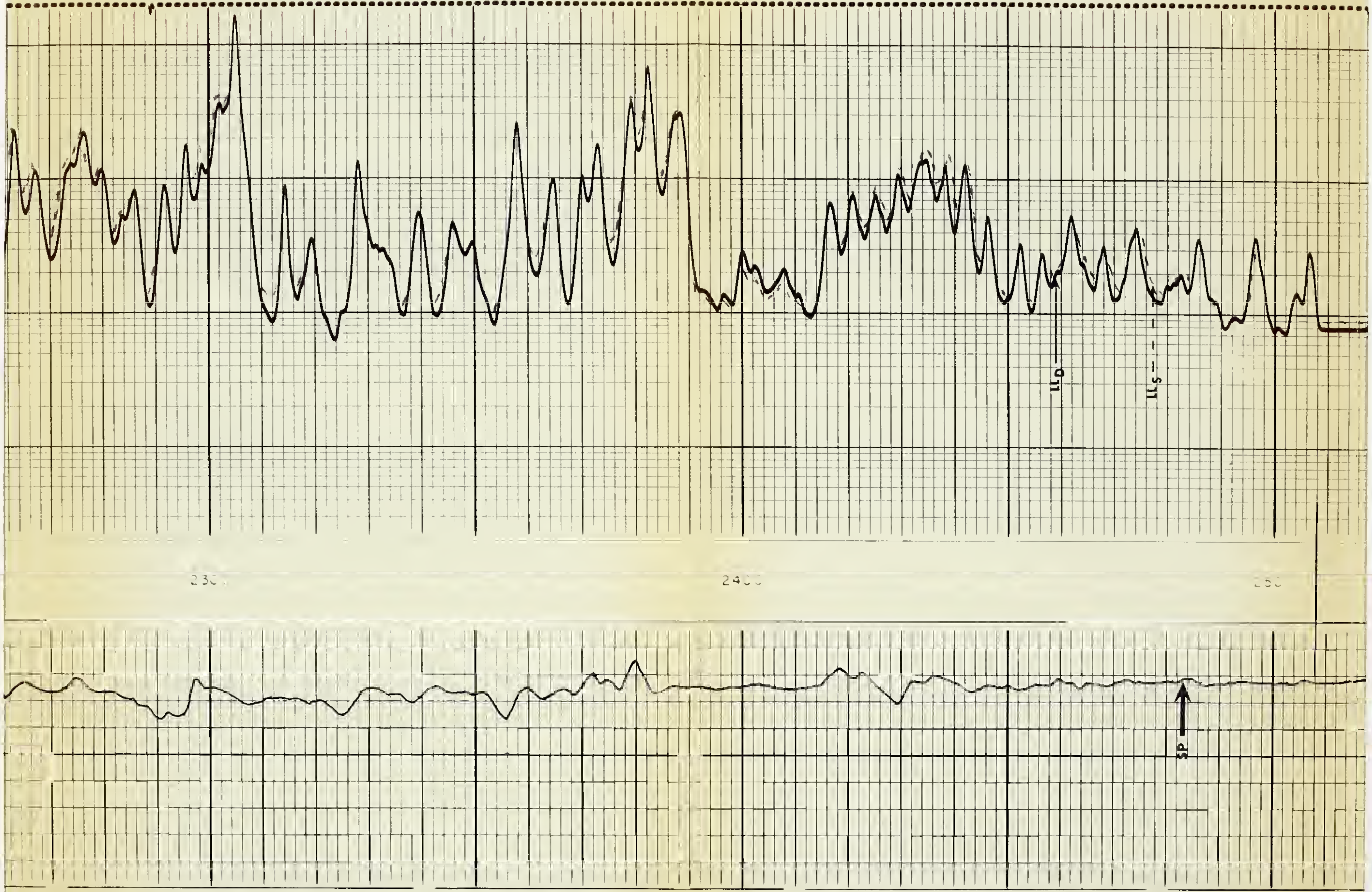



300
400
500

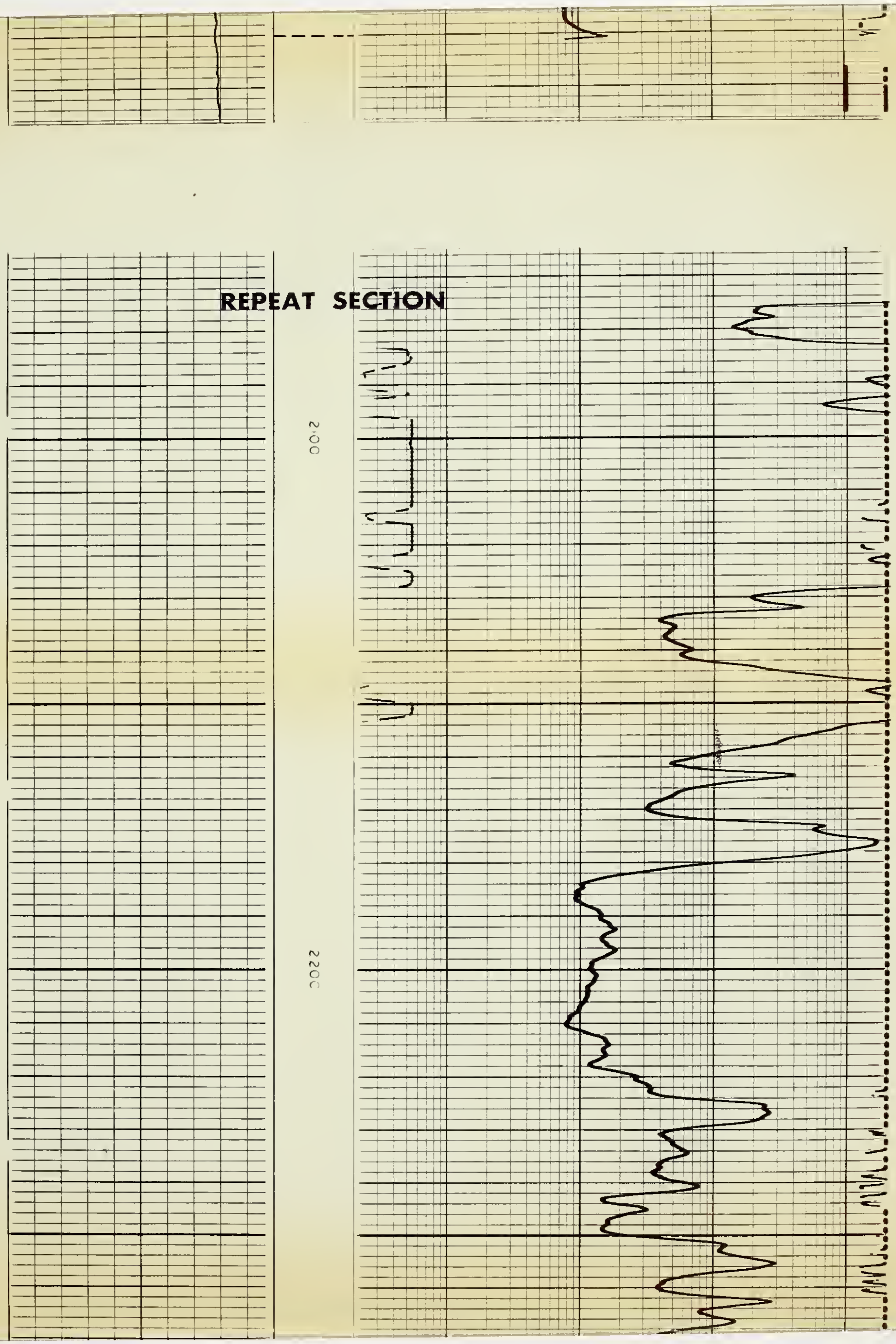

600
700

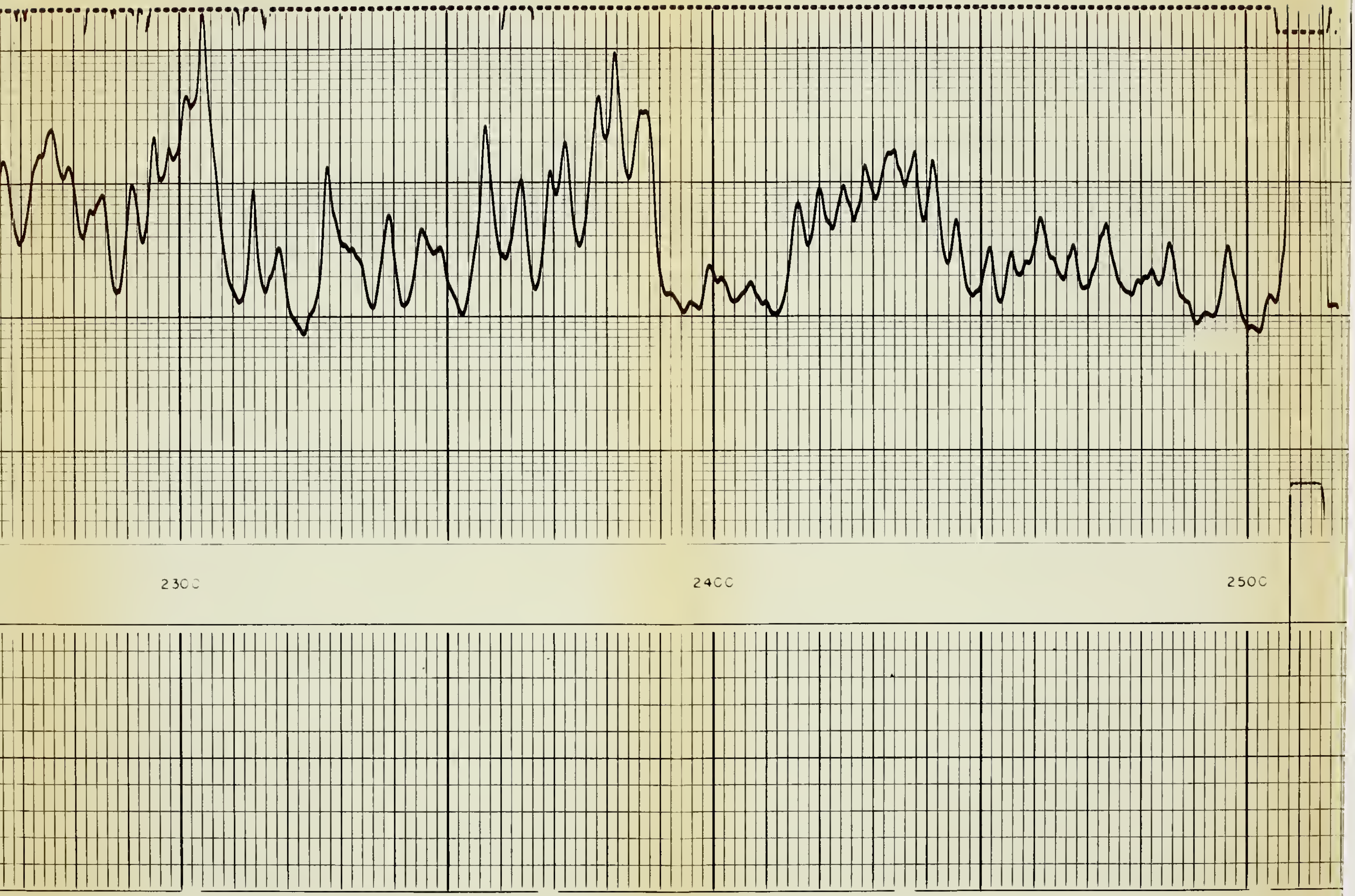

800
900

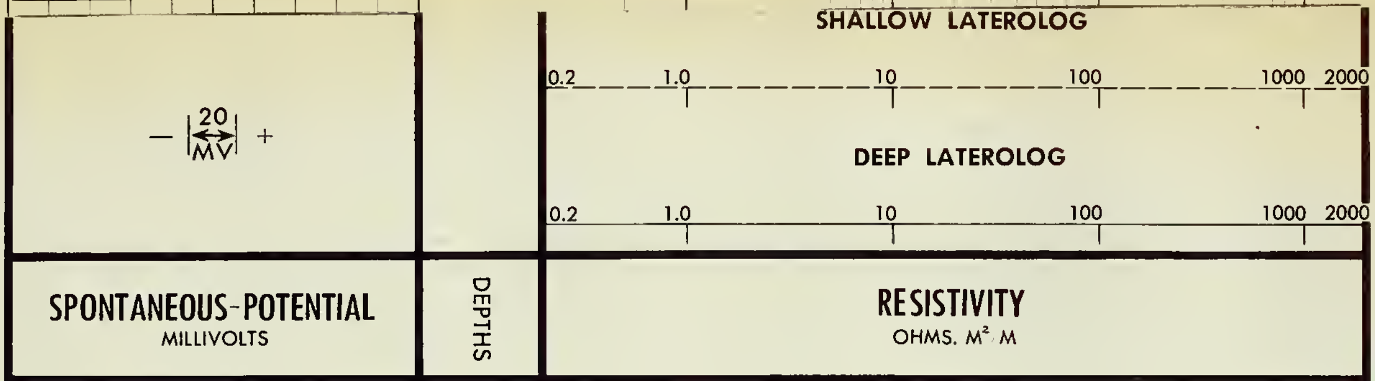

2200



2300
2400
2500
LLD
LLS
SP


REPEAT SECTION
2100
2200

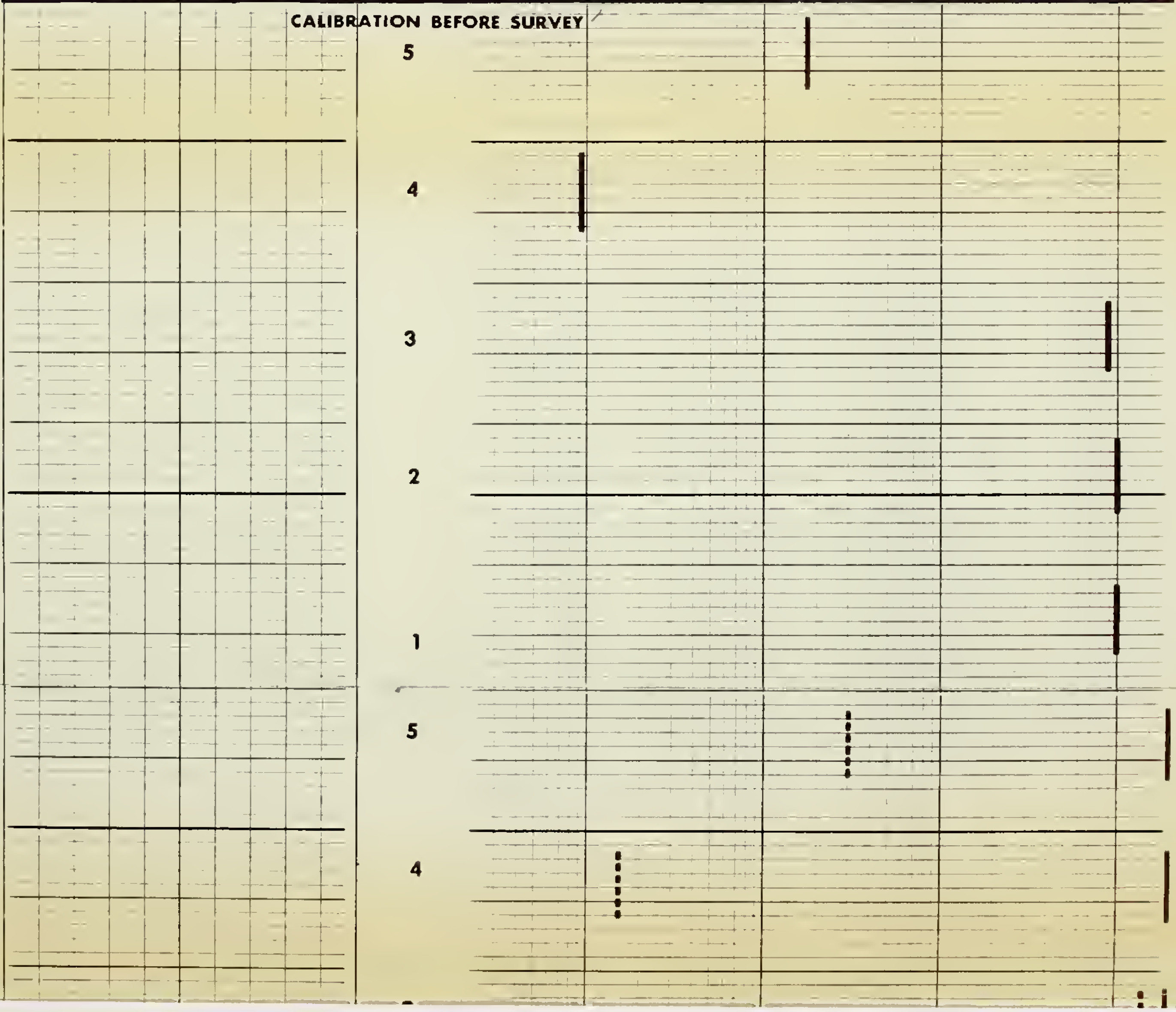

2300
2400
2500

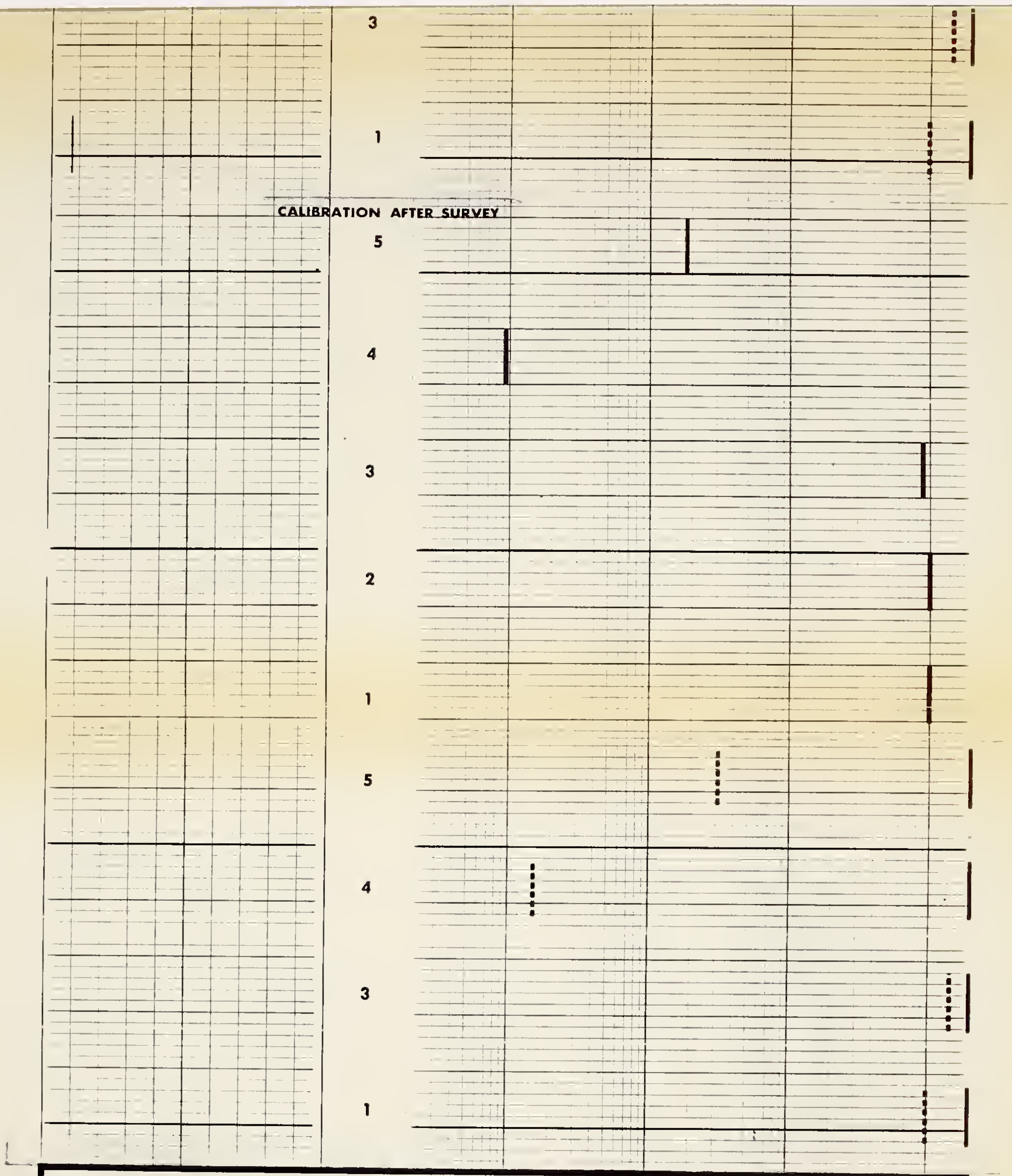


SHALLOW LATEROLOG
0.2
1.0
10
100
1000
2000
DEEP LATEROLOG
0.2
1.0
10
100
1000
2000
− 20 MV +
SPONTANEOUS-POTENTIAL
MILLIVOLTS
DEPTHS
RESISTIVITY
OHMS. M² M

COMPANY	ATLANTIC RICHFIELD COMPANY	SCHL.	FR 2508
WELL	SORGHUM GULCH #1	SCHL.	TD 2520
FIELD	SORGHUM GULCH	DRLR	TD 2525
COUNTY	RIO BLANCO	Elev:	KB 64365
STATE	COLORADO		DF 64355
			GL 6428

CALIBRATION RECORD





SIMULTANEOUS DUAL LATEROLOG CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORD SET (SP CALIBRATE)
3. TEST - 1 (1 ohm-m)
4. TEST - 2 (1000 ohm-m)
5. TOOL CAL (31.6 ohm-m)

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. TEST - 1 - ELECTRICAL ZERO
3. TOOL CAL - BACKGROUND
4. TOOL CAL- TEST JIG ON
5. CAL CHECK f = ______

SEQUENTIAL DUAL LATEROLOG CALIBRATION CODING

1. MECHANICAL ZERO
2. CABLE BALANCE ADJUST - LLd ONLY
3. FUNCTION FORMER 1000 ohm-m
4. FUNCTION FORMER 1 ohm-m
5. MEMORIZER ADJUST - LLd ONLY (DOES NOT APPLY IF GR IS NOT RUN)
6. CALIBRATE LLd - 17 ohm-m
   LLd - 29 ohm-m

CALIBRATION RECORD

COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #1
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

FR 2508
TD 2520
TD 2525

KB 64365
DF 64355
GL 6428

SWS-1975-A

Schlumberger

COMPENSATED FORMATION DENSITY LOG
Gamma-Gamma

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #1
COMPANY ATLANTIC RICHFIELD

COMPANY ALTANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #1

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

Location: API Serial No.
1946' FEL & 1314' FSL
Sec. 2 Twp. 3S Rge. 97W

Other Services:
BHC-GR
GR-AMP-VDL
LL-7

Permanent Datum: GL ; Elev.: 6428
Log Measured From GL , 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. 6436.5
D.F. 6435.5
G.L. 6428

Date	12-7-74			
Run No.	ONE			
Depth—Driller	2525			
Depth—Logger	2522			
Btm. Log Interval	2521			
Top Log Interval	154			
Casing—Driller	8 5/8 @ 156	@	@	@
Casing—Logger	154			
Bit Size	6-3/4			
Type Fluid in Hole	WATER			
Fluid Level	@156 'VARYING			
Dens. | Visc.	8.0 | -			
pH | Fluid Loss	N.A. ml	ml	ml	ml
Source of Sample	MUDPIT			
R_m @ Meas. Temp.	3.7 @ 64 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	- @ °F	@ °F	@ °F	@ °F
Source: R_{mf} | R_{mc}	CLEAR | WATER			
R_m @ BHT	2.2 @ 119 °F	@ °F	@ °F	@ °F
Time Since Circ.	27 HOURS			
Max. Rec. Temp.	119 °F	°F	°F	°F
Equip. | Location	7683 | VRNL			
Recorded By	YATCHAK/ETTER			
Witnessed By	BURNS			

SWS--1381-H

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

LOGGING DATA

Liquid Density	Grain Density	FDC Selectors: Hole Fluid	FDC Selectors: Porosity Scale	From	To
1.0	2.71	LIQUID	-	TD	CSG

REMARKS
Service Order No. - 6930

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.		
Depth - Driller		
Type Fluid		
Source of Sample		
R_m @ Meas. Temp.	@ °F	@ °F
R_{mf} @ Meas. Temp.	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F
R_m @ BHT	@ °F	@ °F
Dens. | Visc.		
pH | Fluid Loss	ml	ml
% Water by Vol.		
% Oil by Vol.		
% Solids by Vol.		
Solids Av. Sp. Gr.		

EQUIPMENT DATA

Run No.	ONE		
Panel No.	462		
Cart No.	165		
Skid No.	320		
Sonde No.	377		
Source	2936		
Calibrator	544		
GR Cart.	204		
TTR	-		
Mem Panel	166		

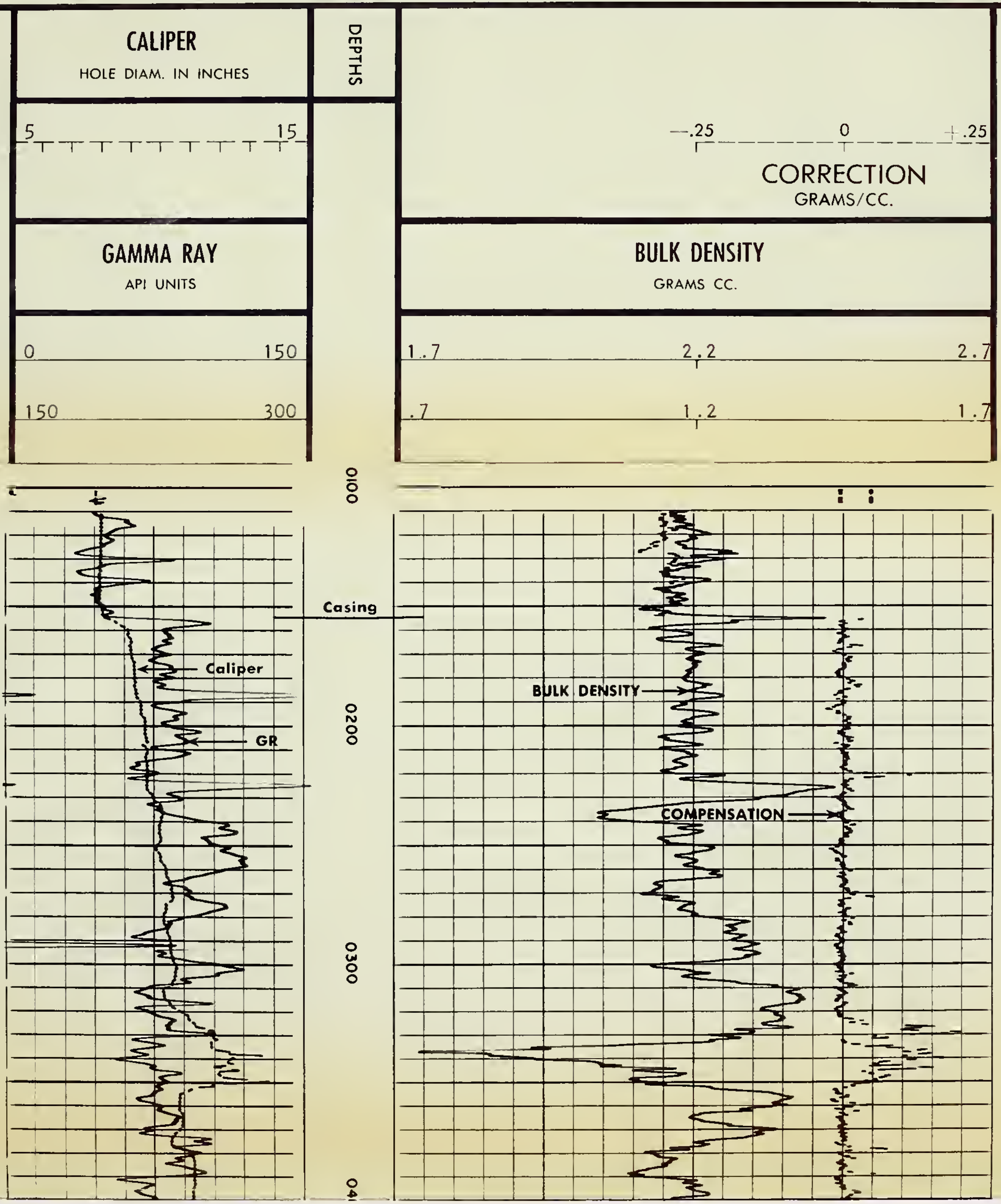
BIT SIZE/CASING DATA

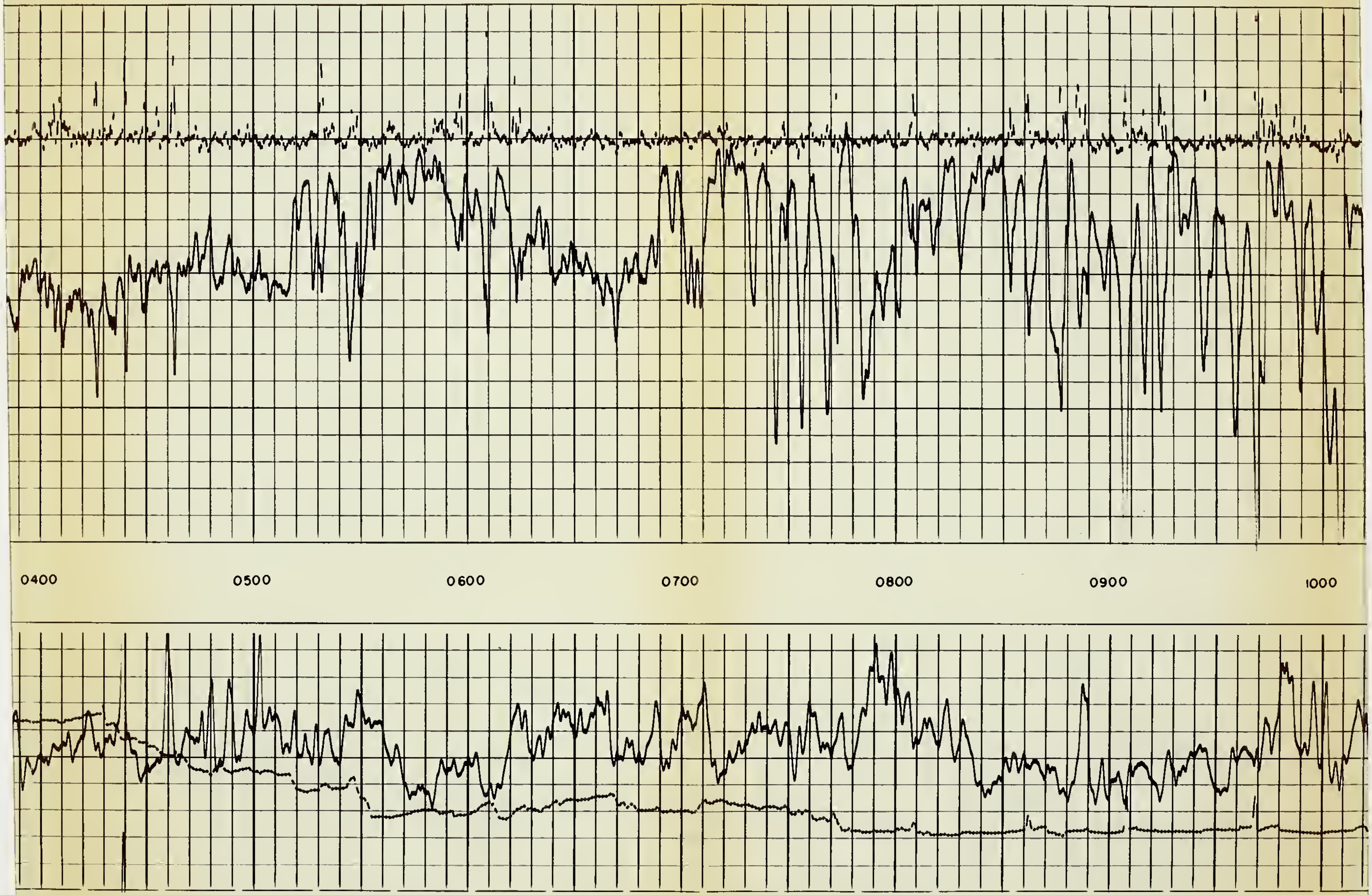
Bit	From	To	Csg. Size	Csg. Wt.	From	To
6 3/4	154	2522	8 5/8	-	SURF	154

CALIBRATION DATA

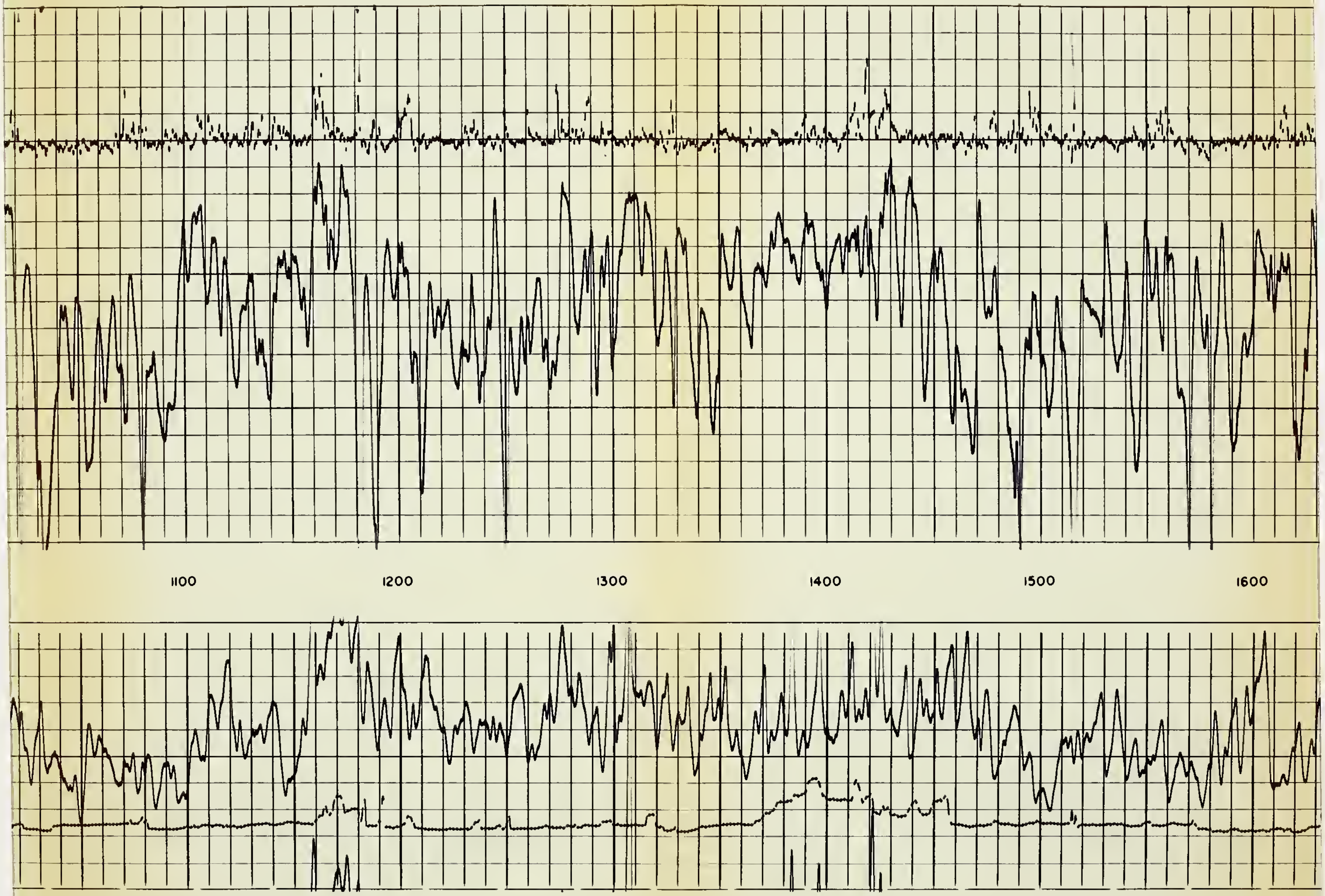
Run No.	Gamma Ray			FDC — Before Lag — ACPS		FDC — After Lag — ACPS	
	API Scale	Background CPS	Total CPS	P_1	P_2	P_1	P_2
1	0-165	70	290	375	750	370	750
2							
3							
4							

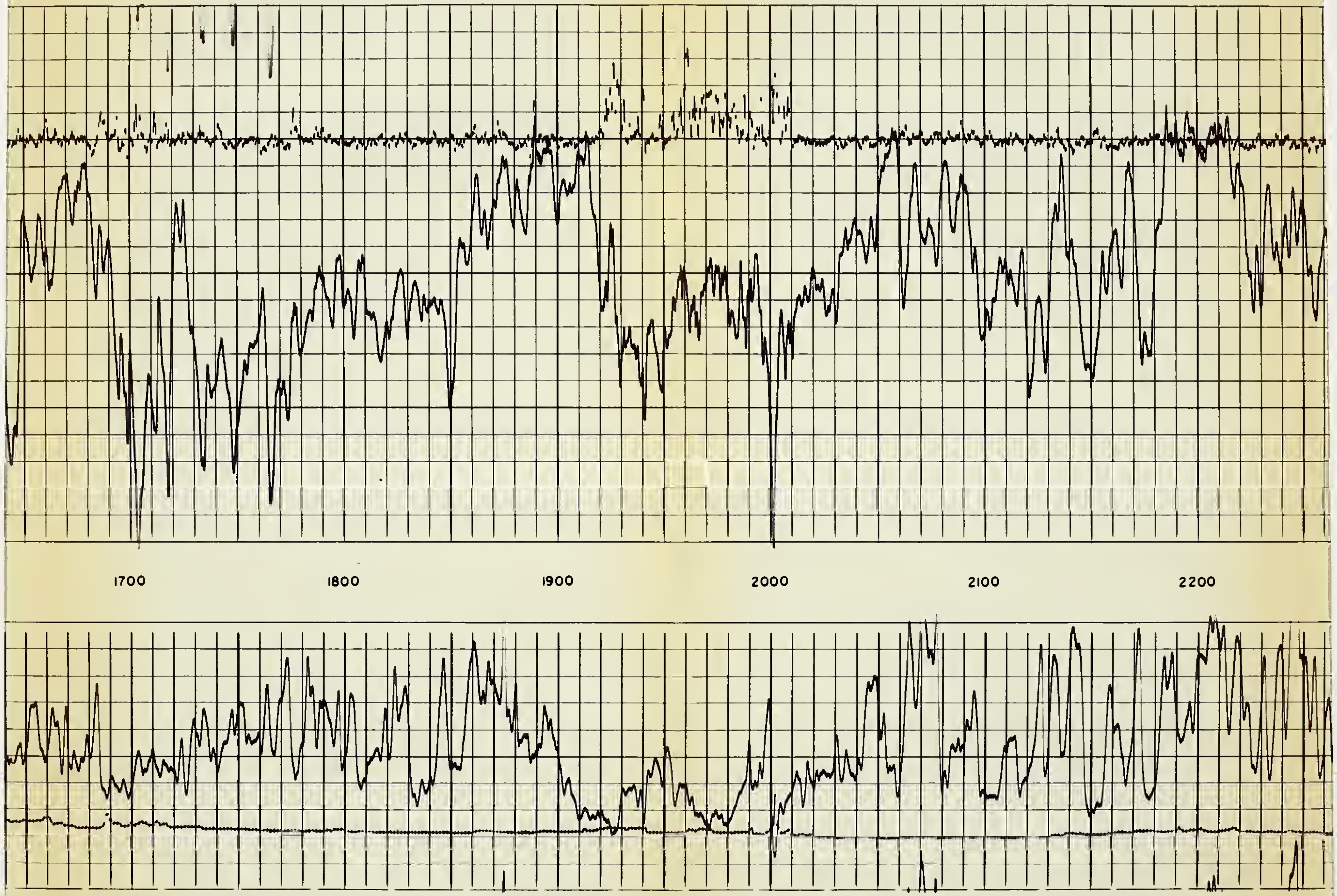
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

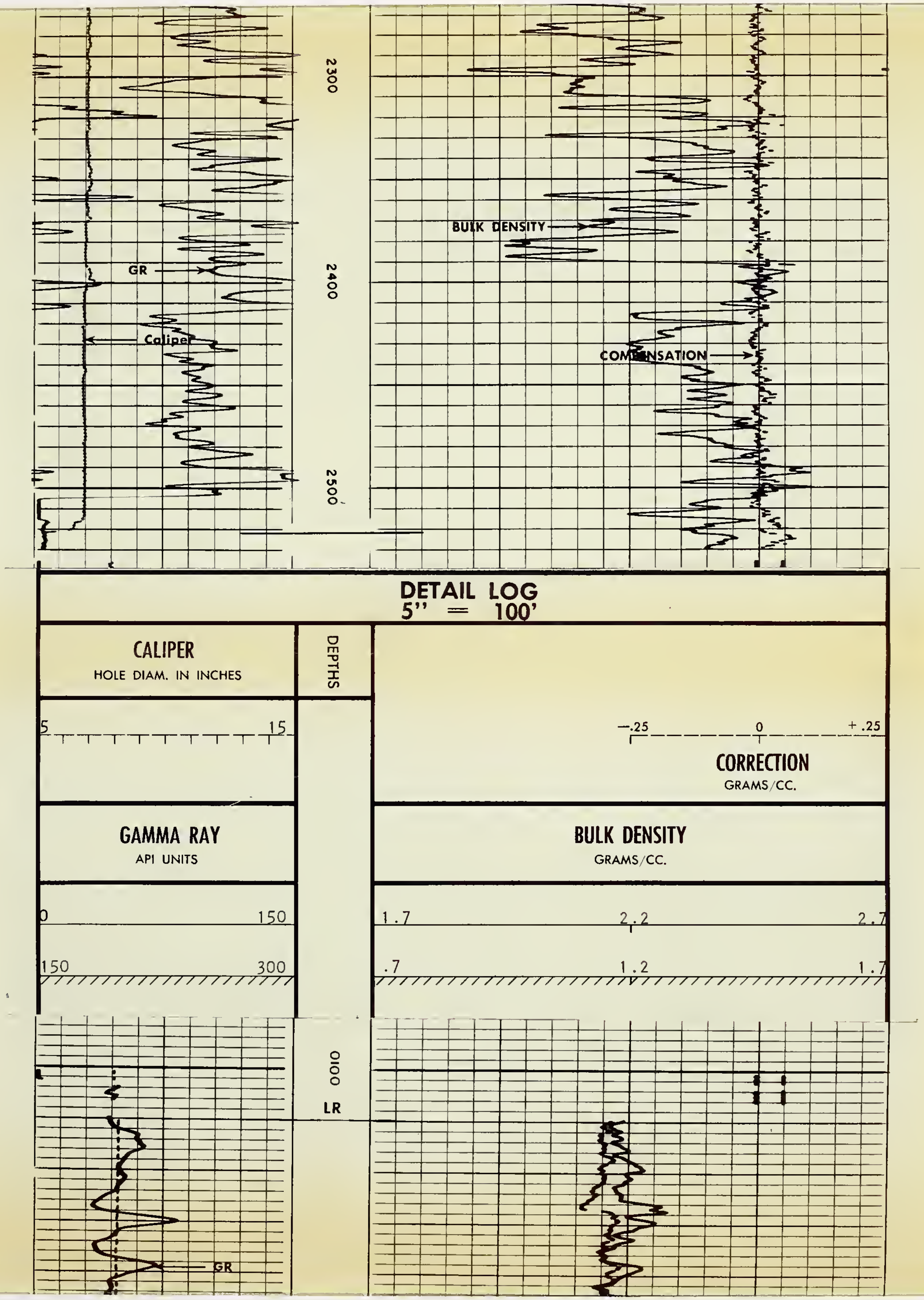


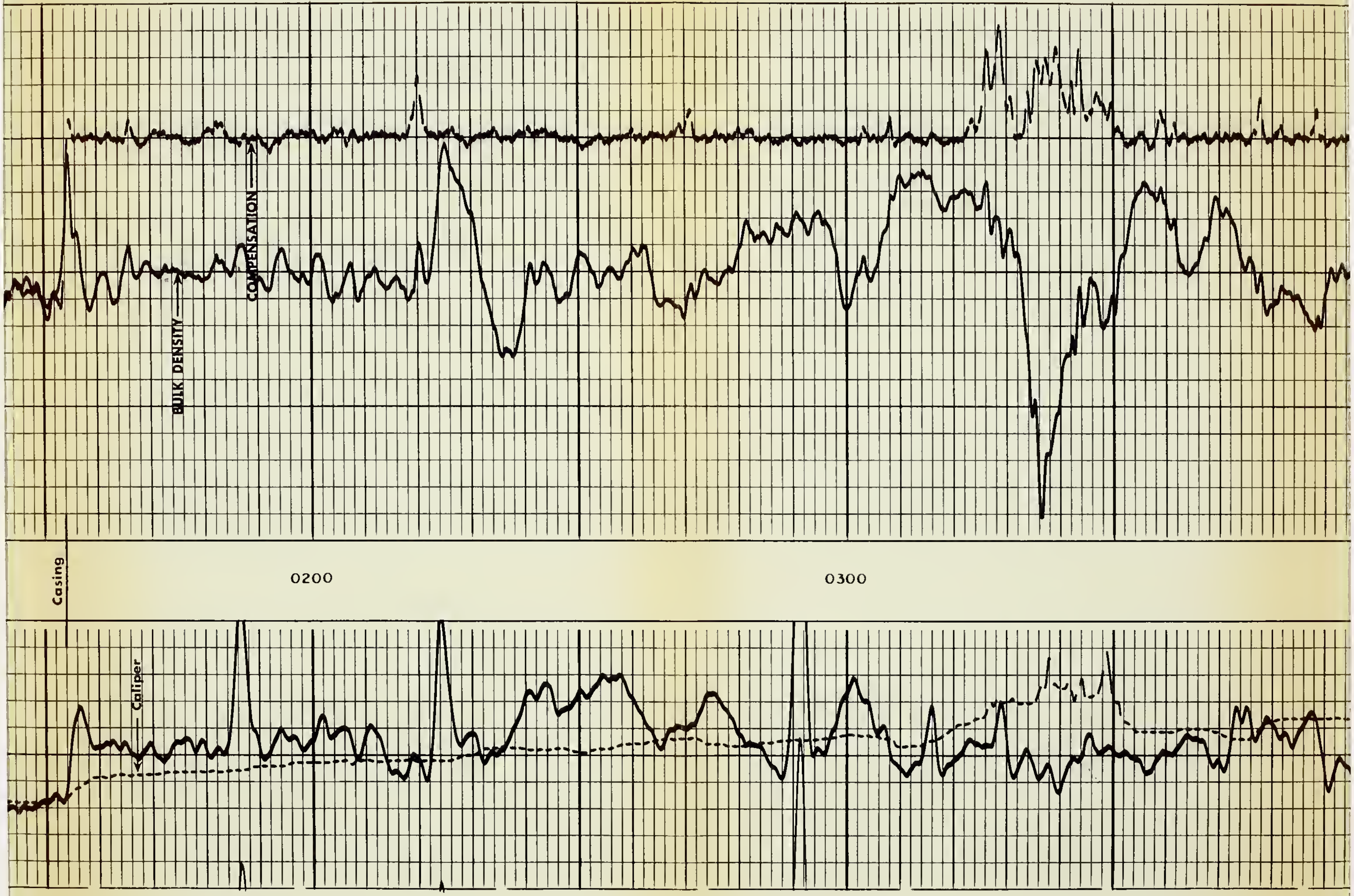


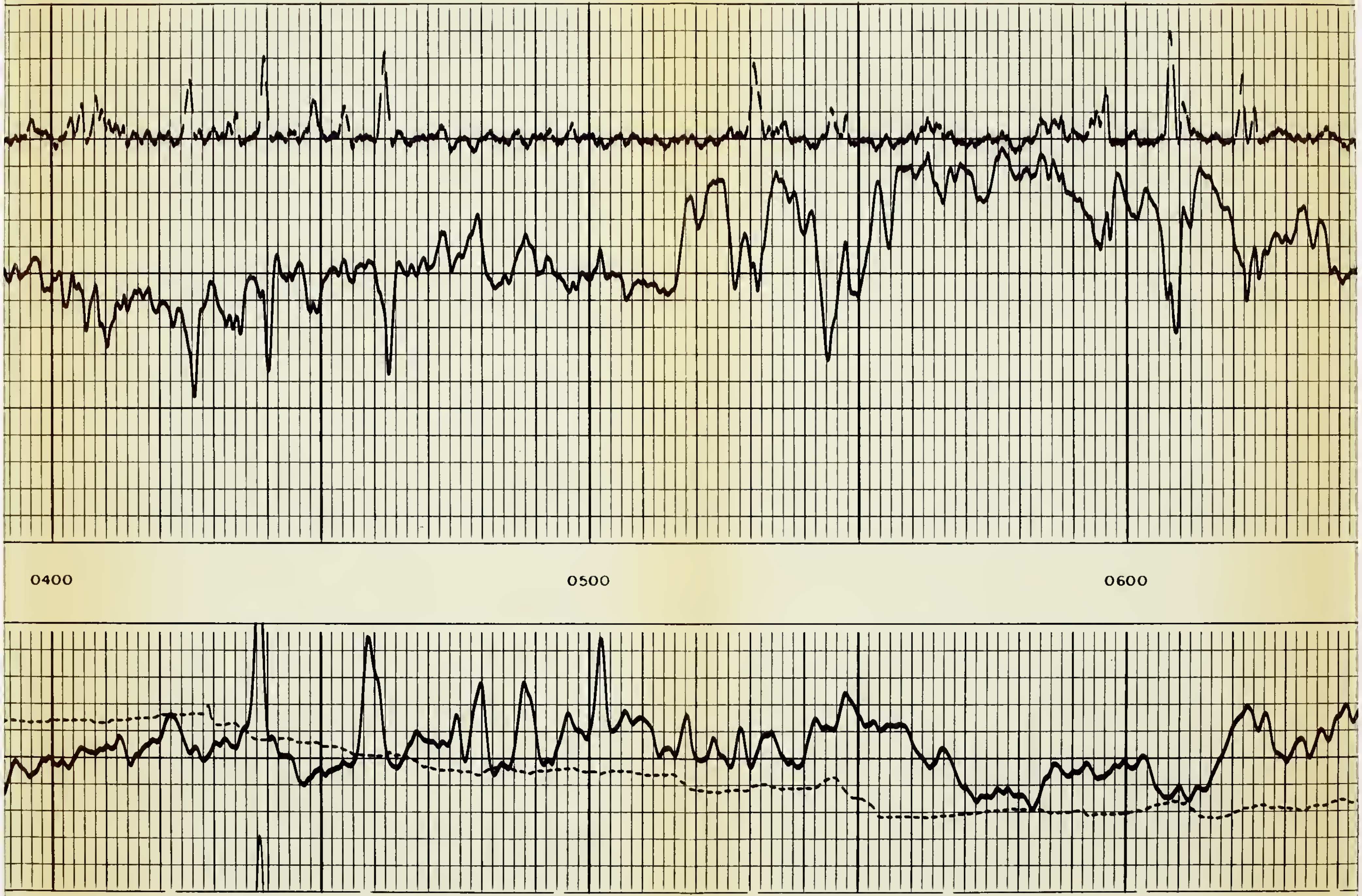
0400
0500
0600
0700
0800
0900
1000

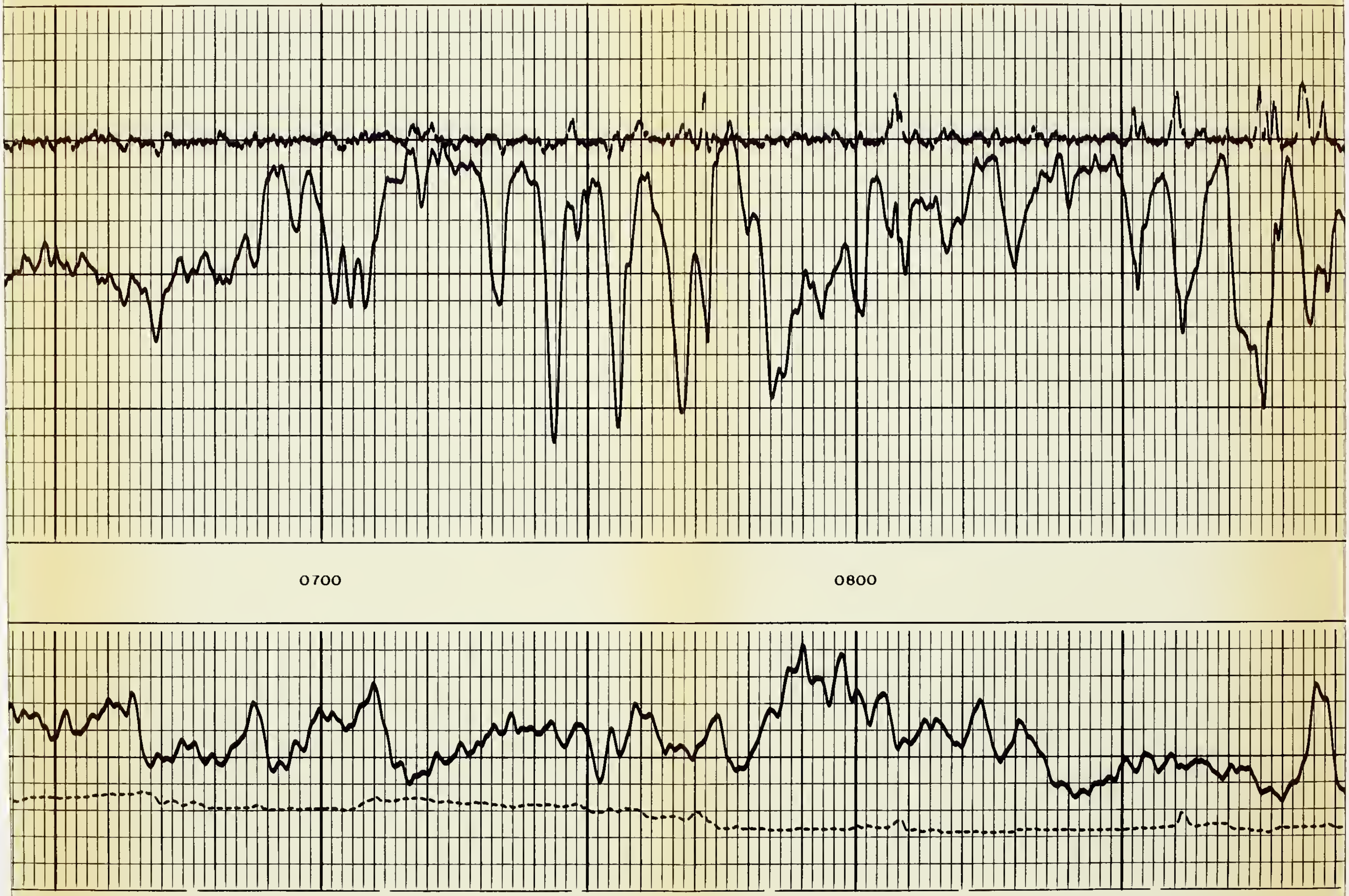

1100
1200
1300
1400
1500
1600

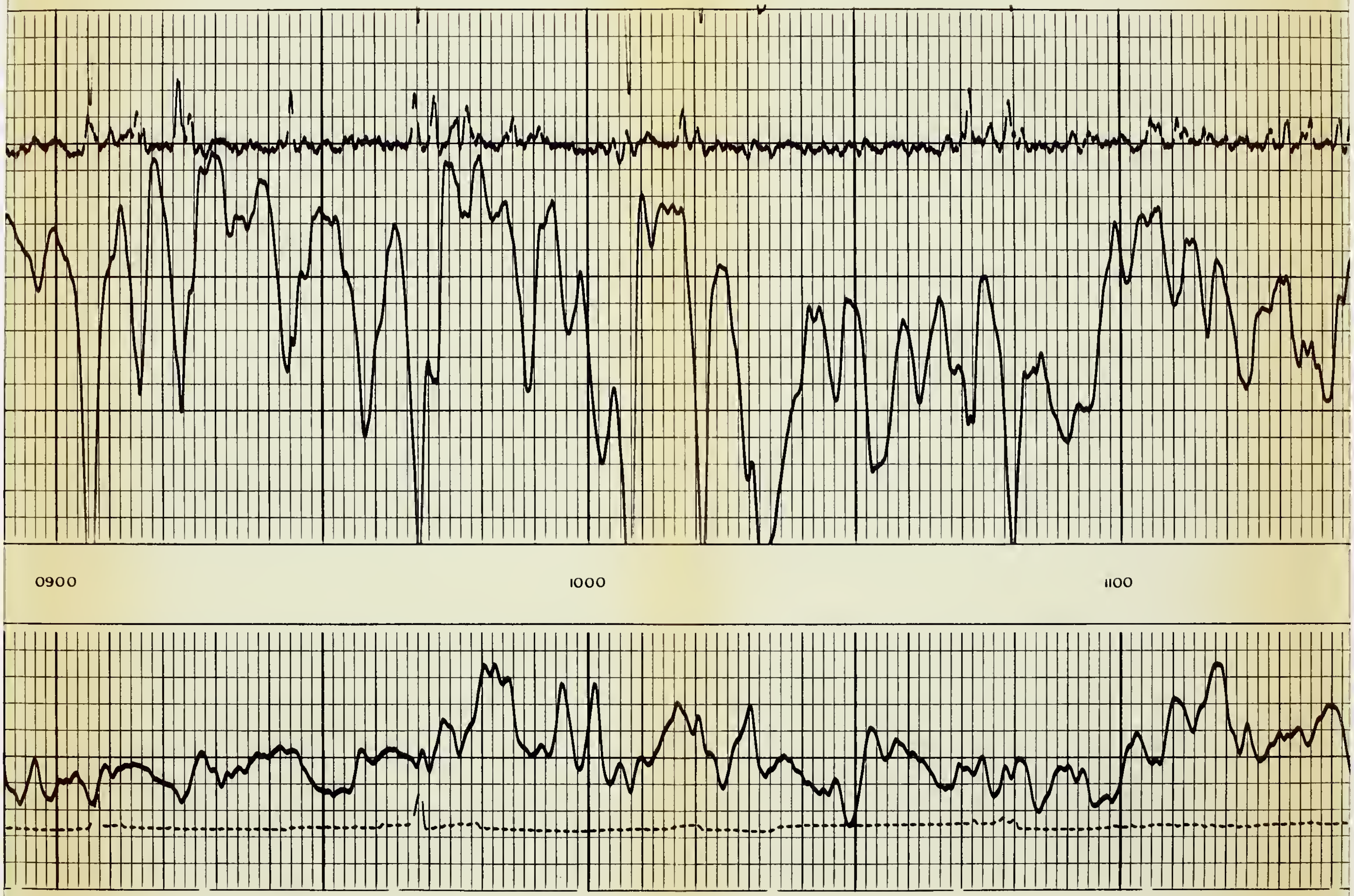

1700
1800
1900
2000
2100
2200

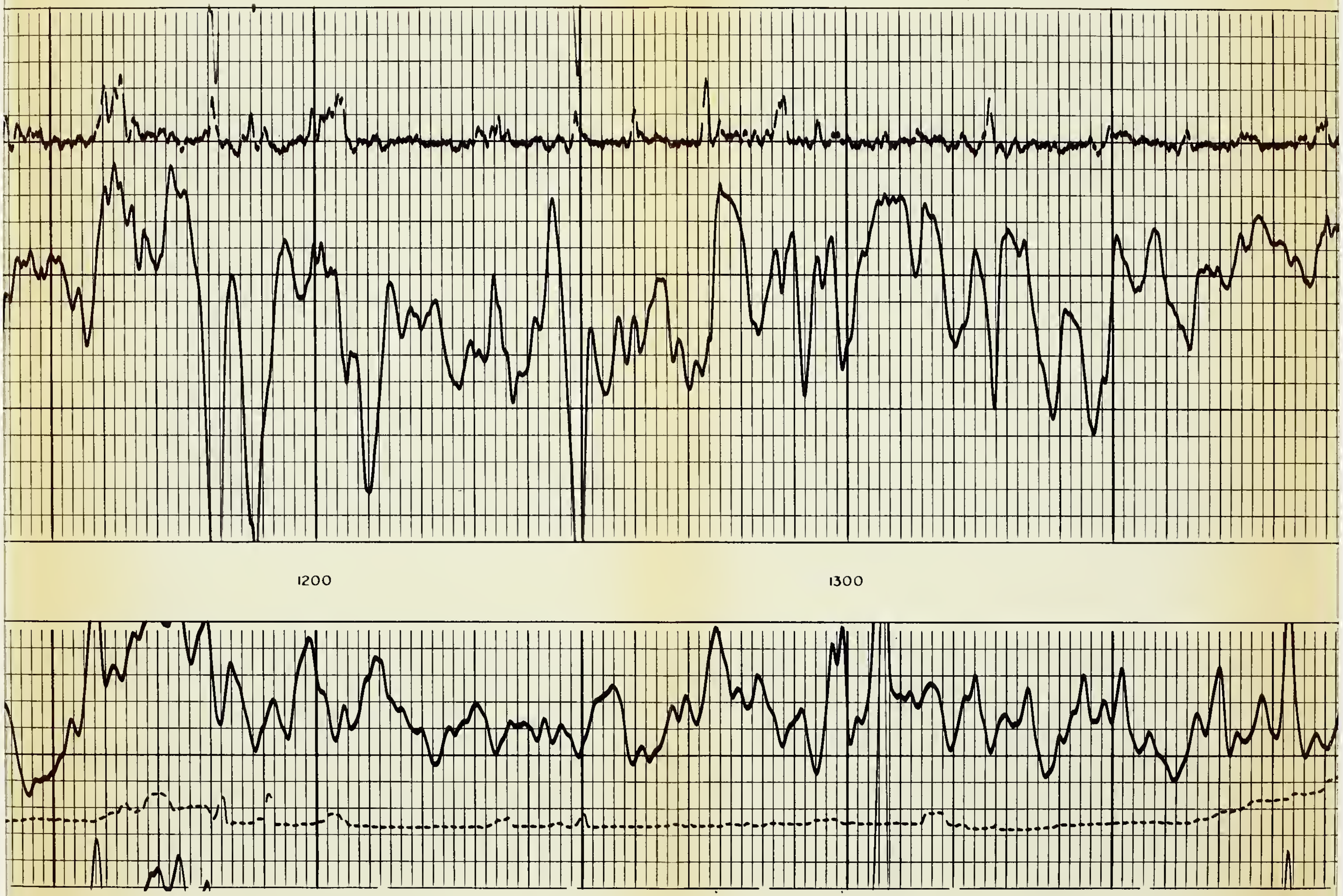

2300
2400
2500
GR
Caliper
BULK DENSITY
COMPENSATION
DETAIL LOG
5" = 100'
CALIPER
HOLE DIAM. IN INCHES
5
15
DEPTHS
−.25
0
+.25
CORRECTION
GRAMS/CC.
GAMMA RAY
API UNITS
BULK DENSITY
GRAMS/CC.
0
150
1.7
2.2
2.7
150
300
.7
1.2
1.7
0100
LR
GR

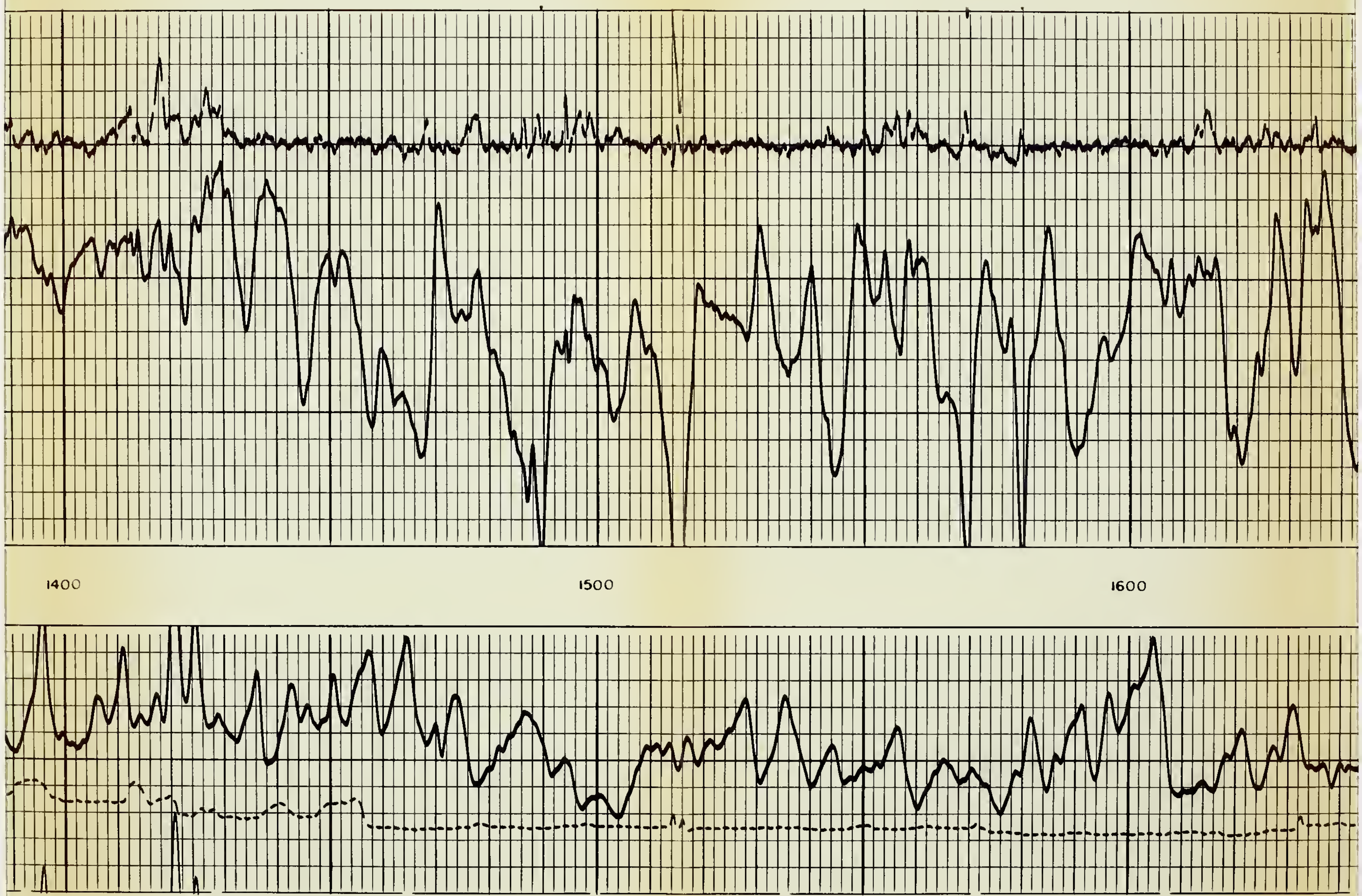

BULK DENSITY
COMPENSATION
Casing
0200
0300
Caliper

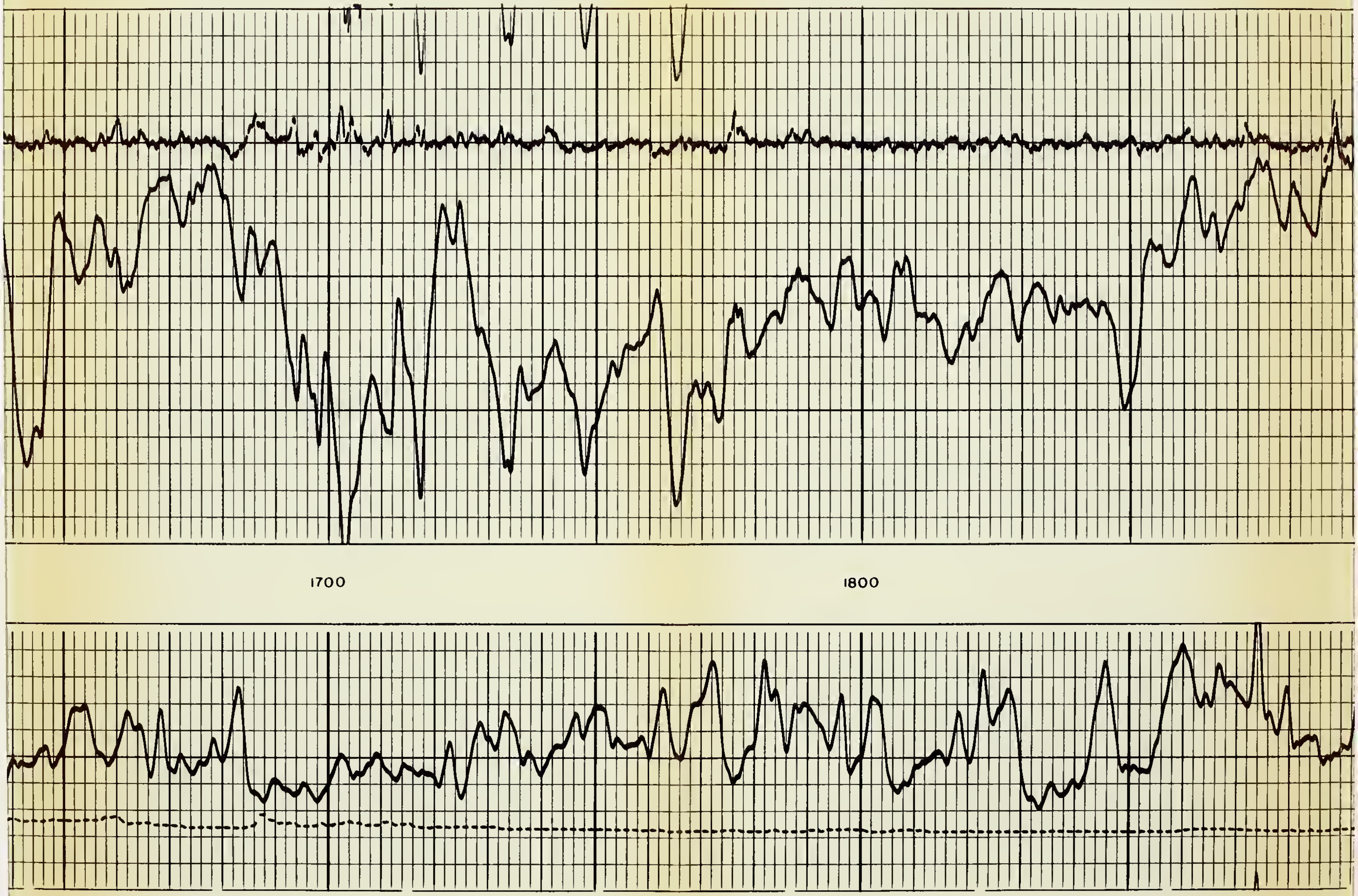

0400
0500
0600

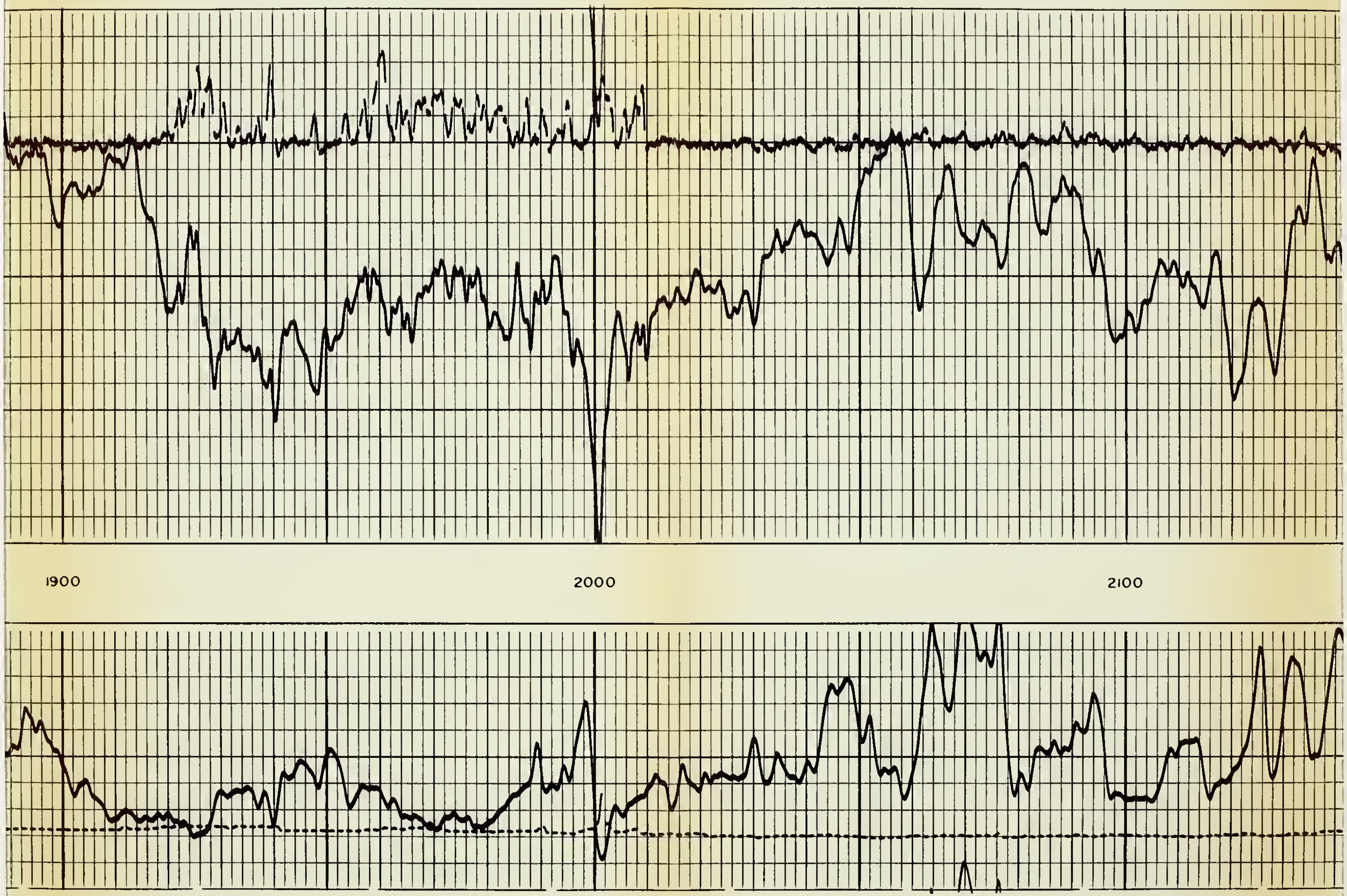

0700
0800

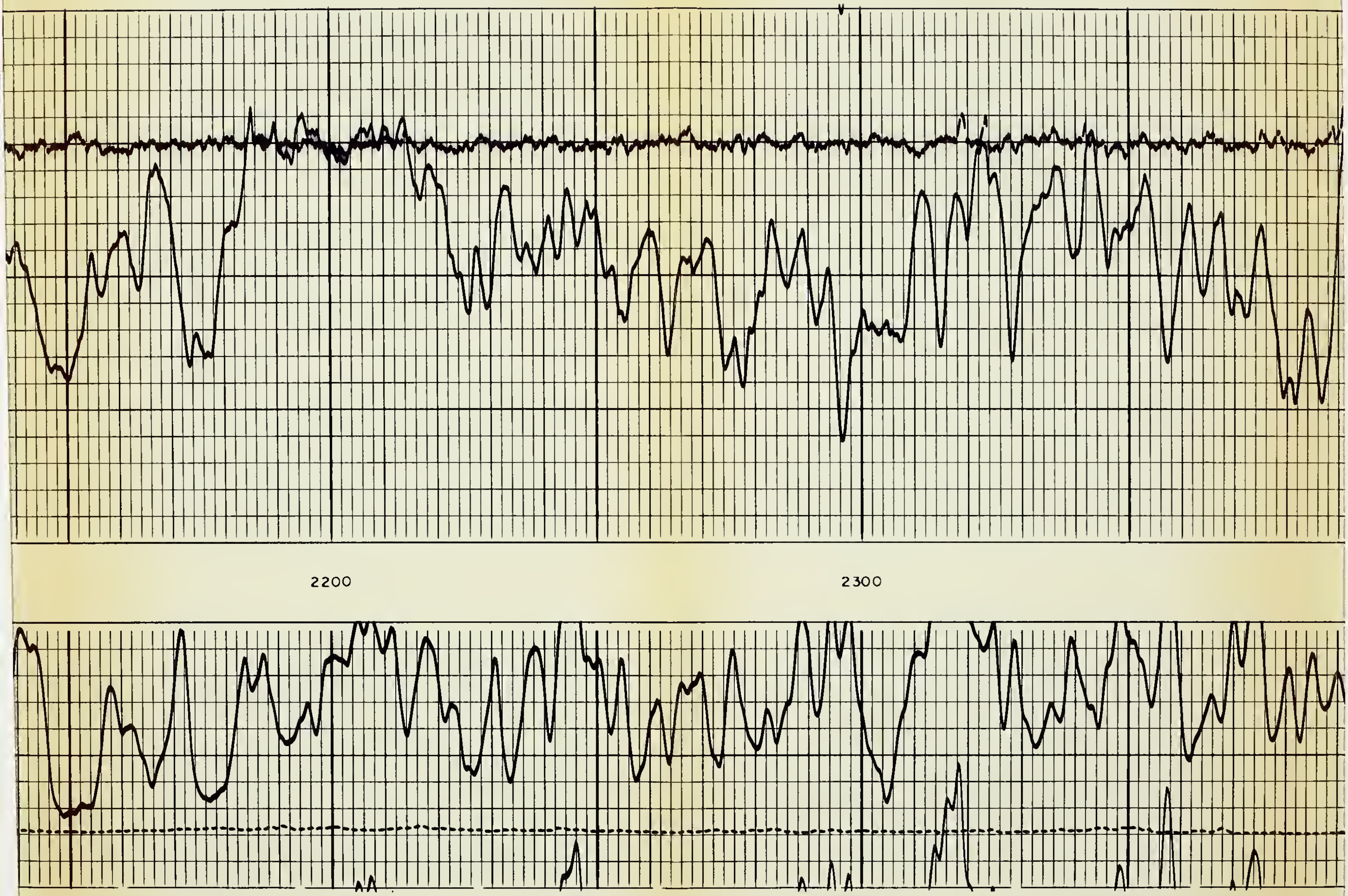

0900
1000
1100

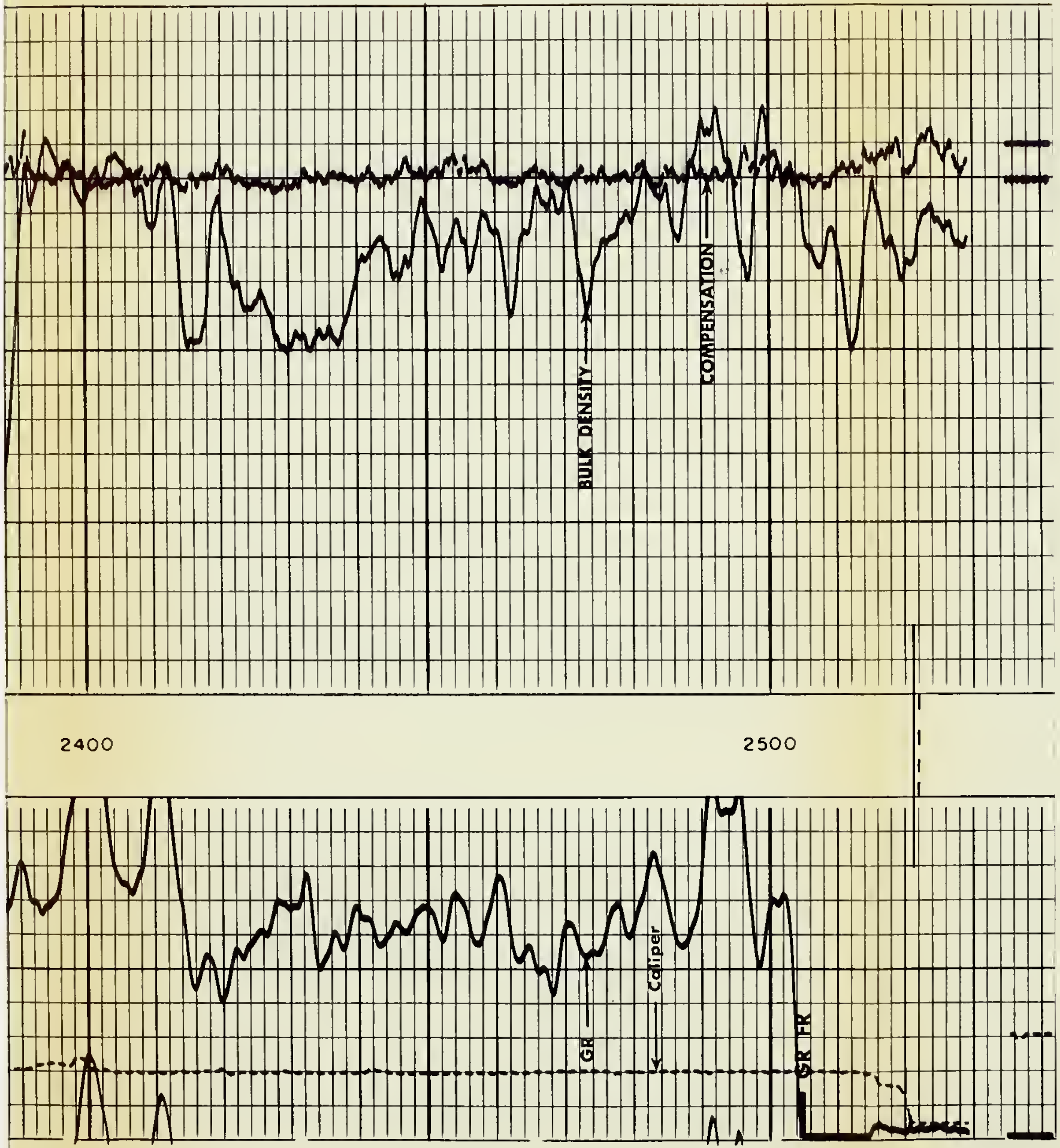

1200
1300

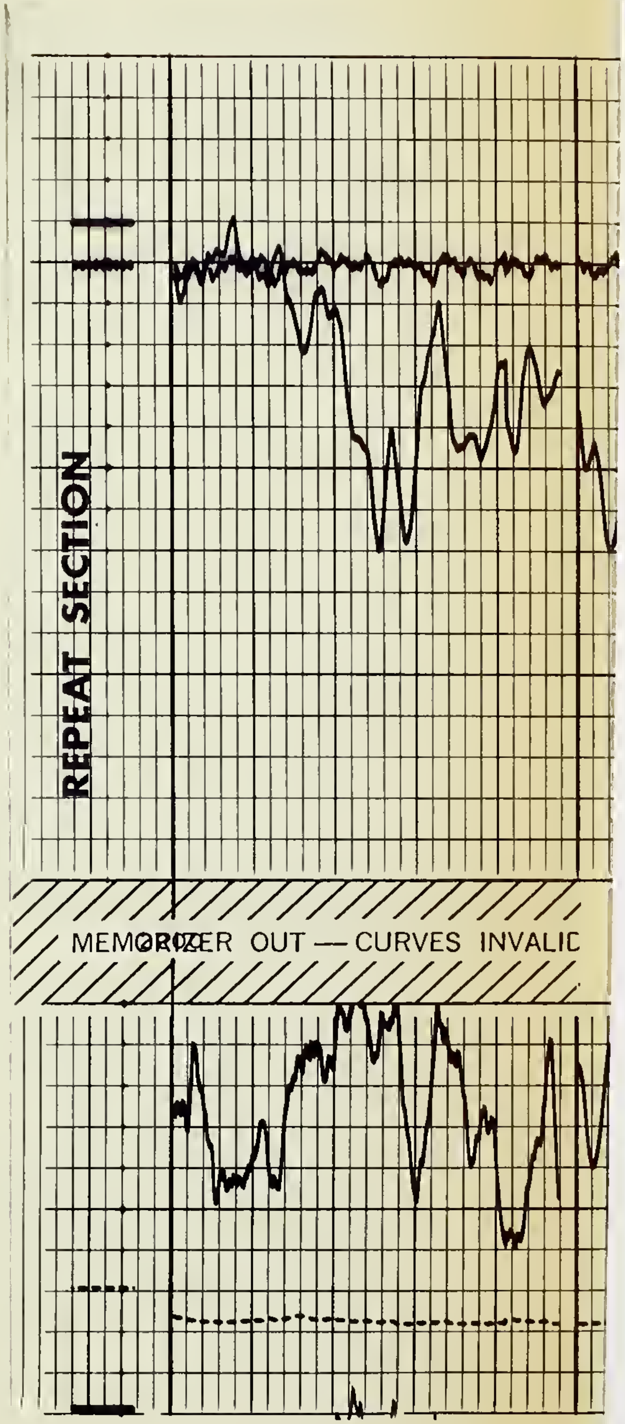

1400
1500
1600

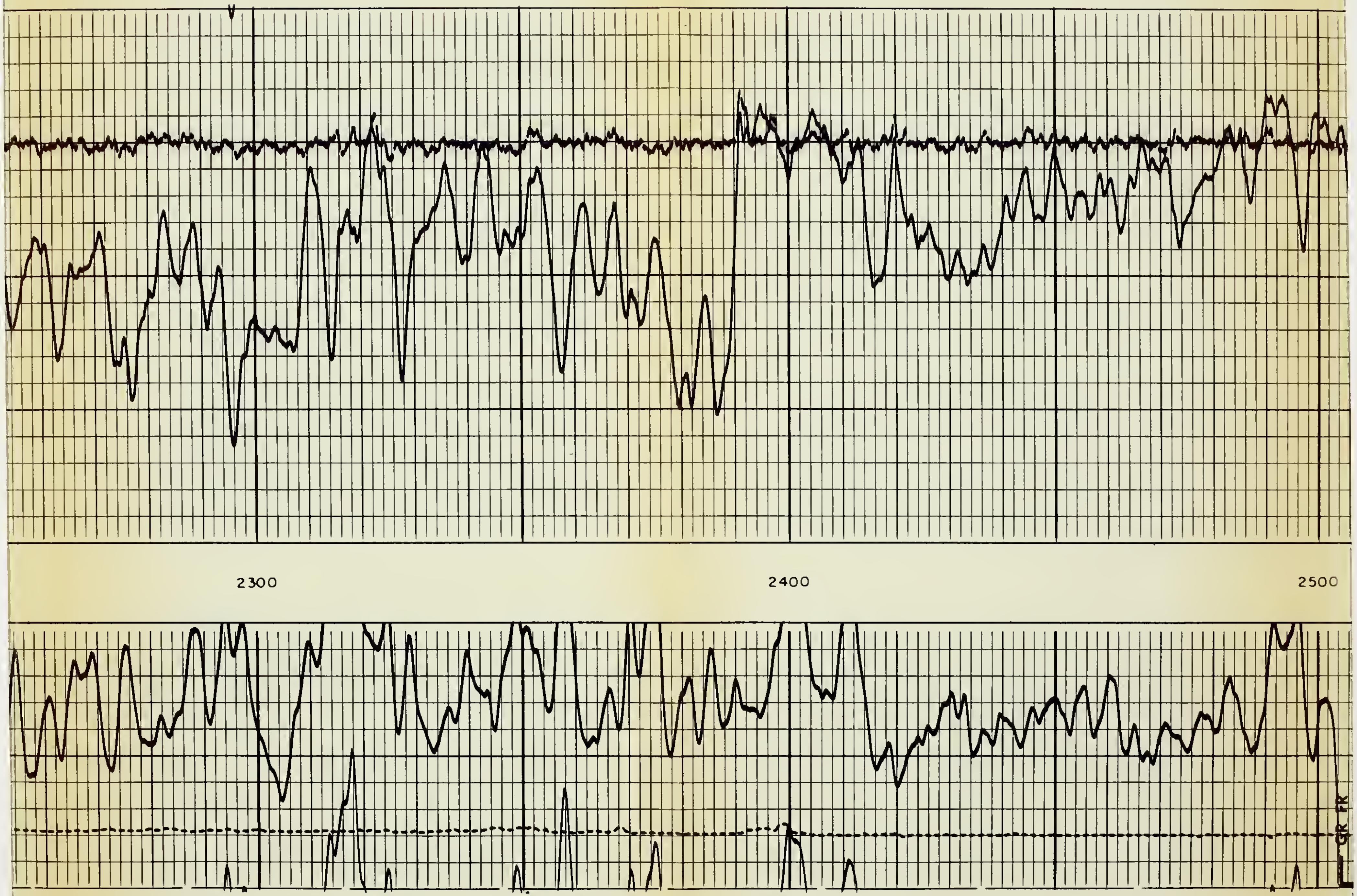

1700
1800

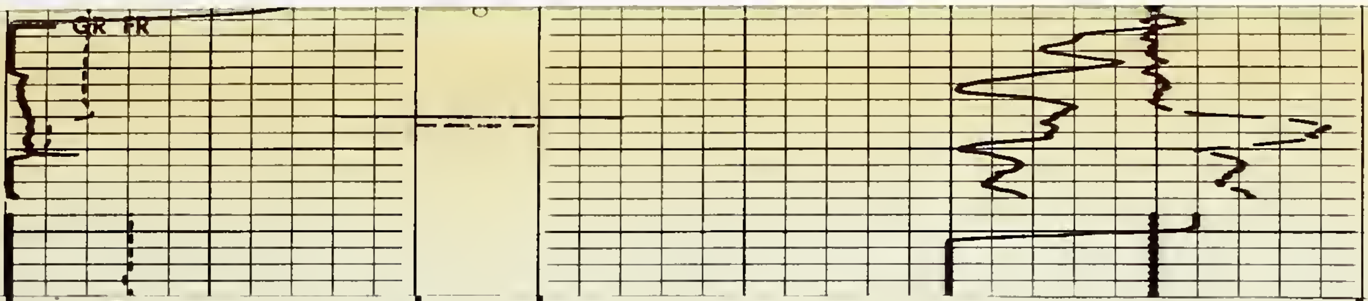

1900
2000
2100


2200
2300


BULK DENSITY
COMPENSATION
2400
2500
GR
Caliper
GR FR


REPEAT SECTION
MEMORIZER OUT — CURVES INVALID


2300
2400
2500
GR FR



0 150

150 300

GAMMA RAY
API UNITS

5 15

CALIPER
HOLE DIAM. IN INCHES

DEPTHS

1.7 2.2 2.7

.7 1.2 1.7

BULK DENSITY
GRAMS/CC.

−.25 0 +.25

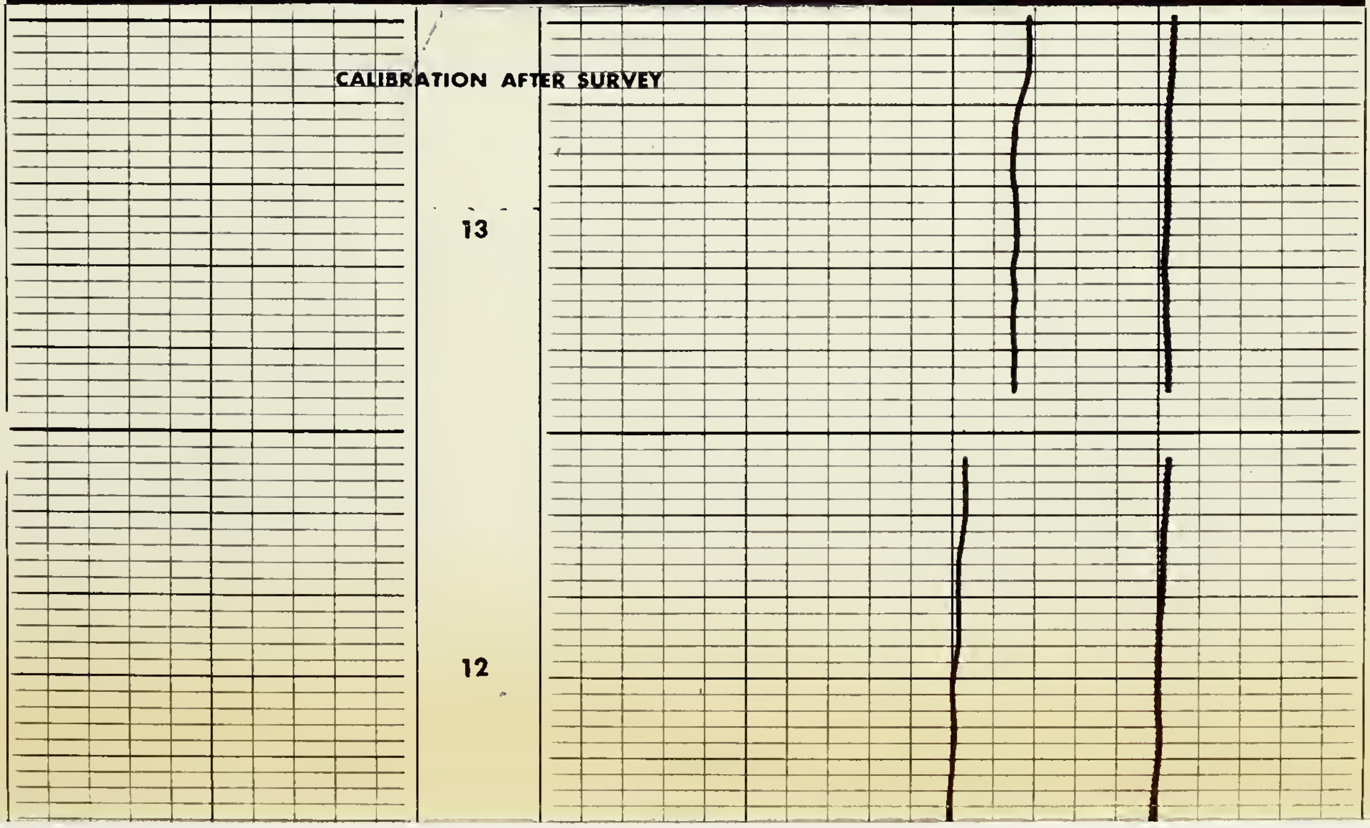
CORRECTION
GRAMS/CC.

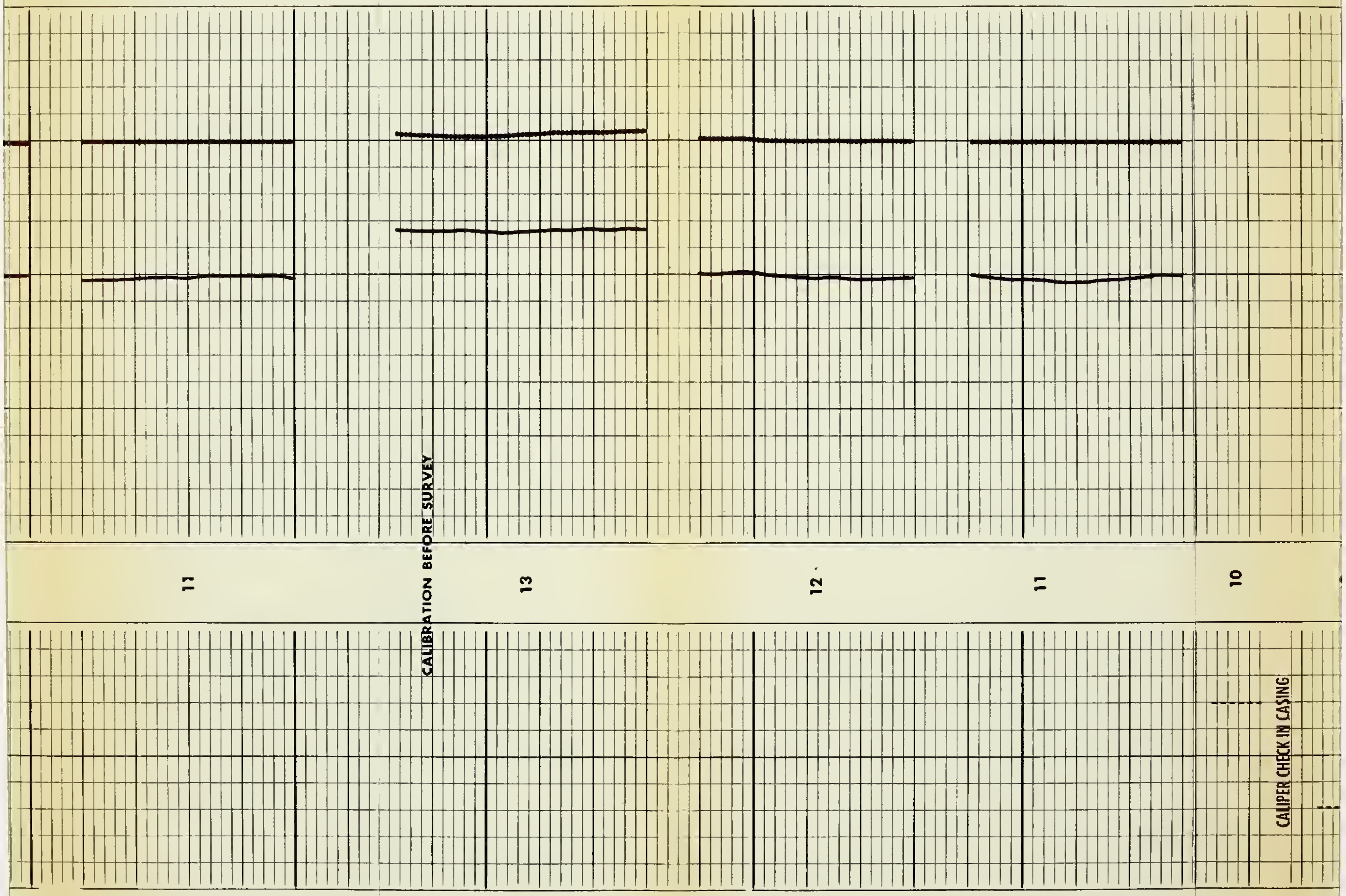
COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #1
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

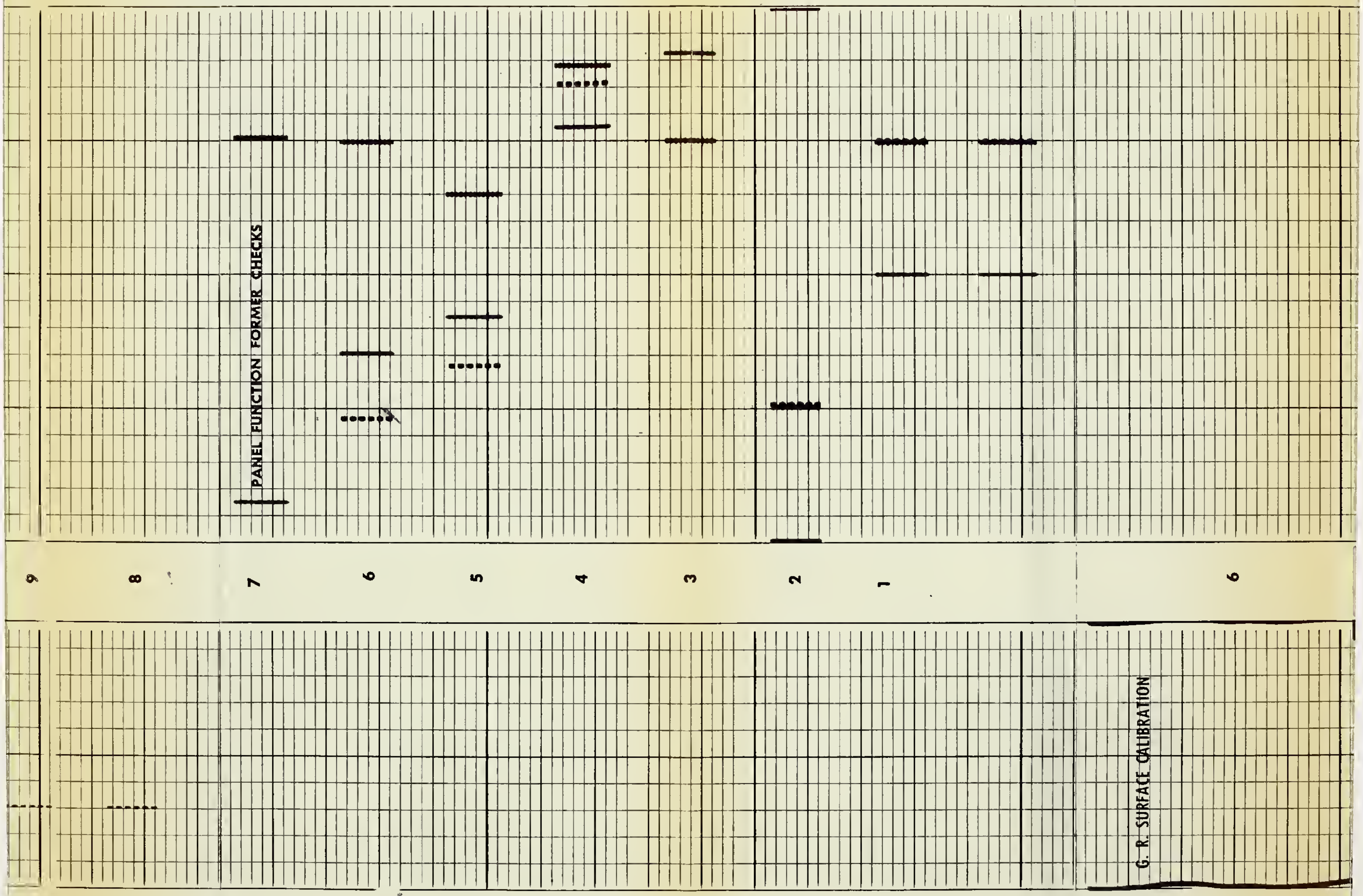
Rm ____ @ ____ °F
BHT ____ °F

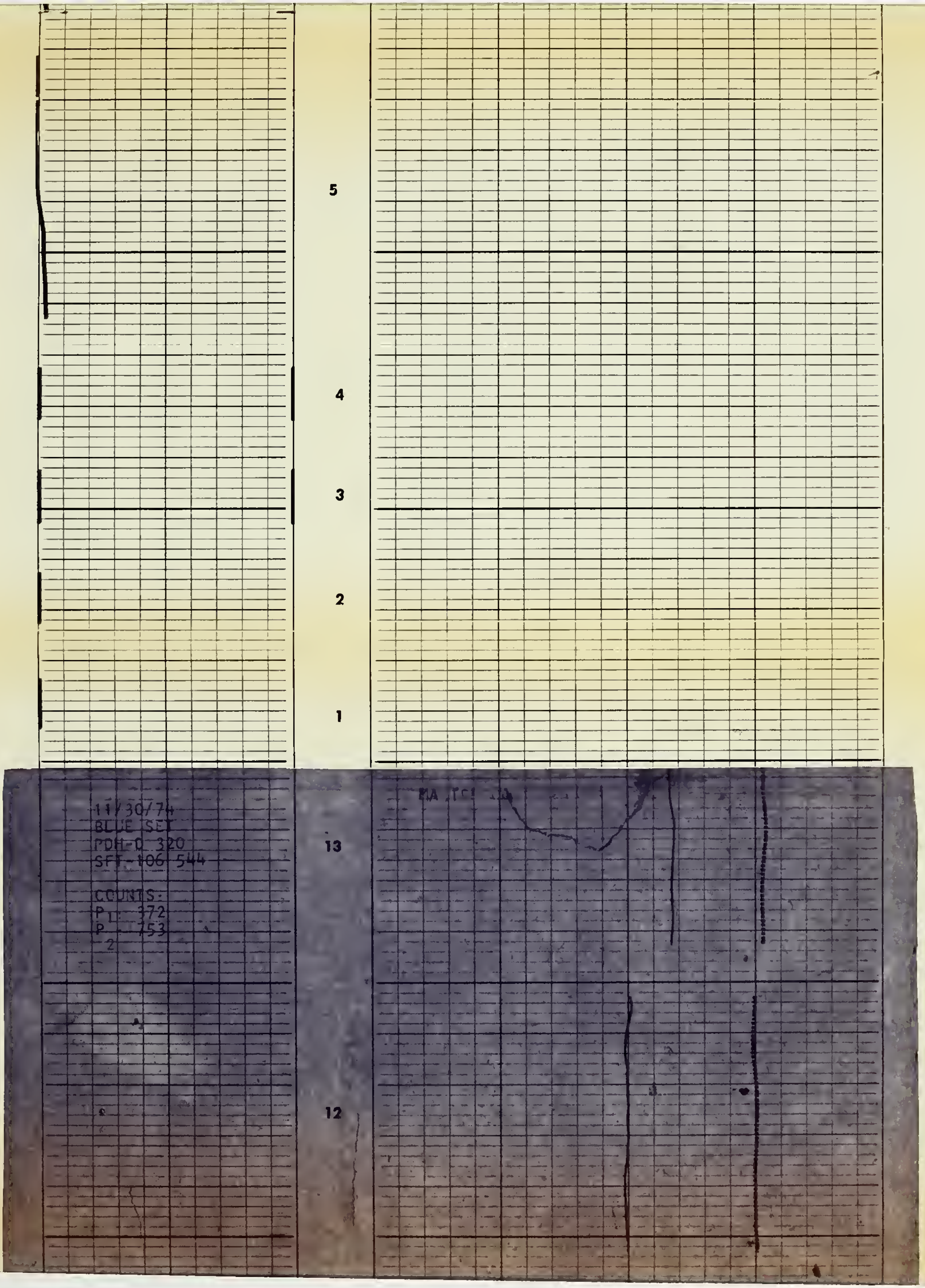
SCHL. FR 2525
SCHL. TD 2522
DRLR TD 2521
Elev:
KB 6436.5
DF 6435.5
GL 6428

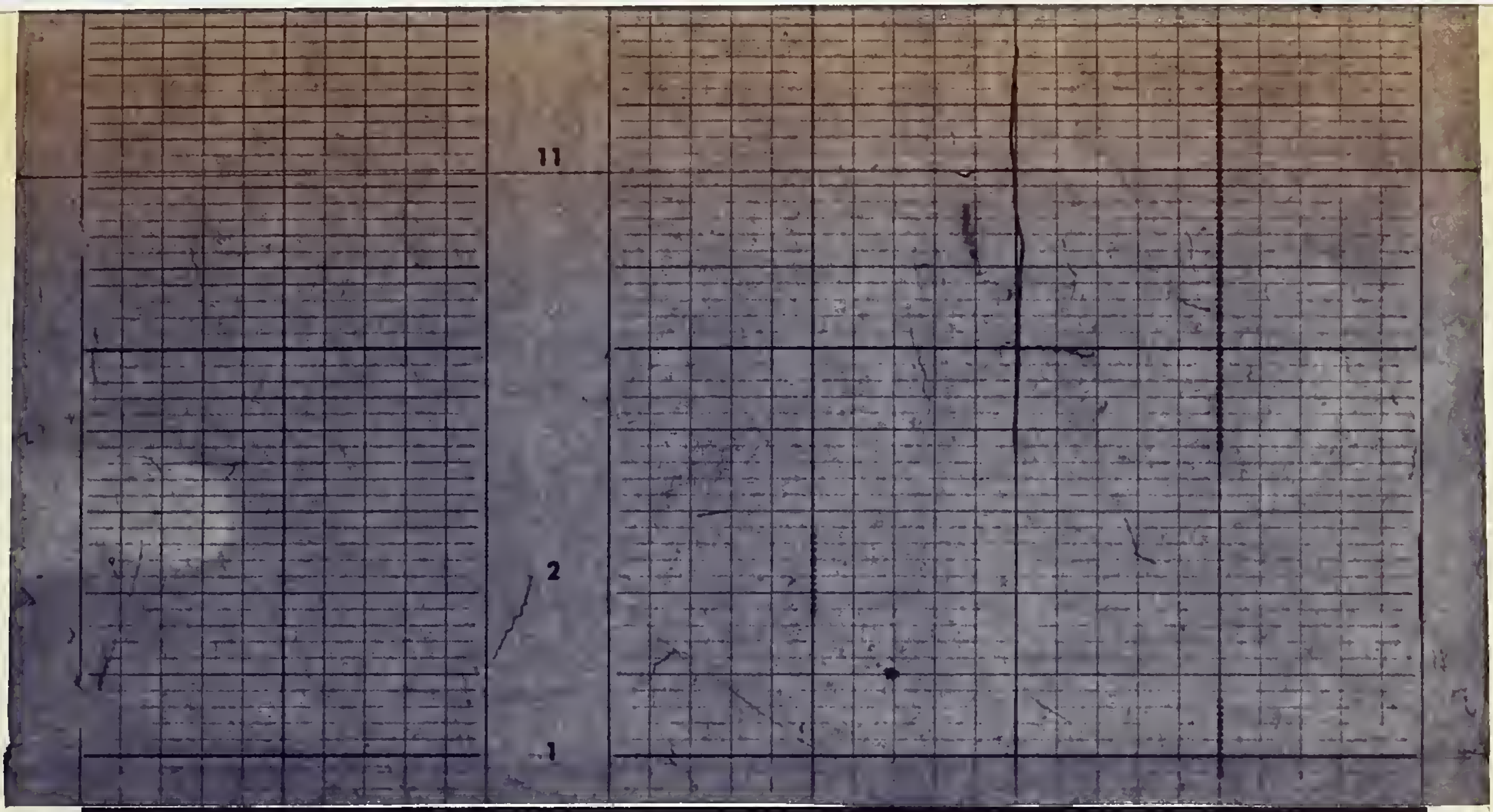
CALIBRATION RECORD




CALIPER CHECK IN CASING
10
11
12
13
CALIBRATION BEFORE SURVEY
11


PANEL FUNCTION FORMER CHECKS
G. R. SURFACE CALIBRATION
9
8
7
6
5
4
3
2
1
6


5
4
3
2
1
13
12
11/30/74
BLUE SET
PDH-0 320
SFT-106 544
COUNTS:
P1 372
P2 753



FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST

FDC LIQUID

	POS	ρ	$\Delta\rho$
3.	# 1	2.92	.00
4.	# 2	2.78	+.14
5.	# 3	2.42	−.10
6.	# 4	2.35	.00
7.	# 5	2.08	.01

8. MECHANICAL ZERO CALIPER
9. 8″ RING
10. 12″ RING
11. TOOL CALIBRATE # 1 SET $\rho = 2.50$
12. TOOL CALIBRATE # 2 SET $\Delta\rho = .00$
13. LOG POSITION $\rho = 2.59$, $\Delta\rho = .015$

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATE - SOURCE IN PLACE

CALIBRATION RECORD

COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #1
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2525
SCHL. TD 2522
DRLR TD 2521
Elev:
KB 6436.5
DF 6435.5
GL 6428

Schlumberger

TEMPERATURE LOG

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #1
COMPANY ATLANTIC RICHFIEL

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH NO. 1

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION
1946'-FEL & 1314'-FSL
Sec. 2 Twp. 3S Rge. 97W

Other Services:
AMP-BHC-GR
FDC-GR
DLL

Permanent Datum: GL ; Elev.: 6428
Log Measured From KB , 0 Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 6436.5
D.F. 6435.5
G.L. 6428

Date	12-13-74		
Run No.	TWO		
Depth—Driller	2525		
Depth—Logger	2524		
Btm. Log Interval	2523		
Top Log Interval	153		
Casing—Driller	8-5/8 @ 156	@	@
Casing—Logger	153		
Casing Size 1	8-5/8 To 156	To	To
2	To	To	To
Casing Weight 1			
2			
Casing Thickness 1			
2			
Bit Size 1	6-3/4 To 2525	To	To
2	To	To	To
Type Fluid in Hole	CLEAR WATER		
Dens. | Visc.			
Time Since Circ.	NOT KNOWN		
BHT	122		
Equip. | Location	7699 | GJ		
Recorded By	MOSS		
Witnessed By	BURNS		

SWS-368-C

The well name, location and borehole reference data were furnished by the customer.

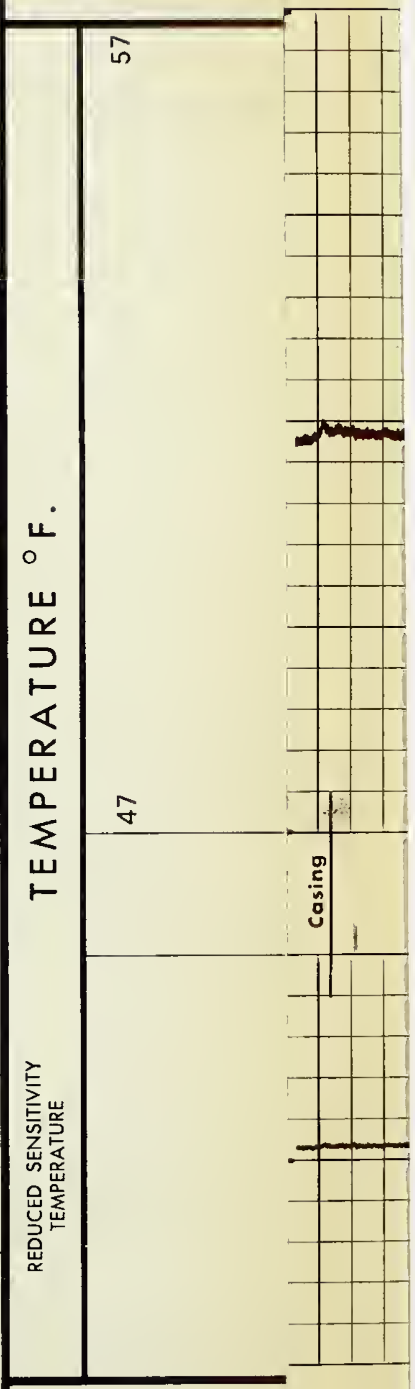
FOLD HERE

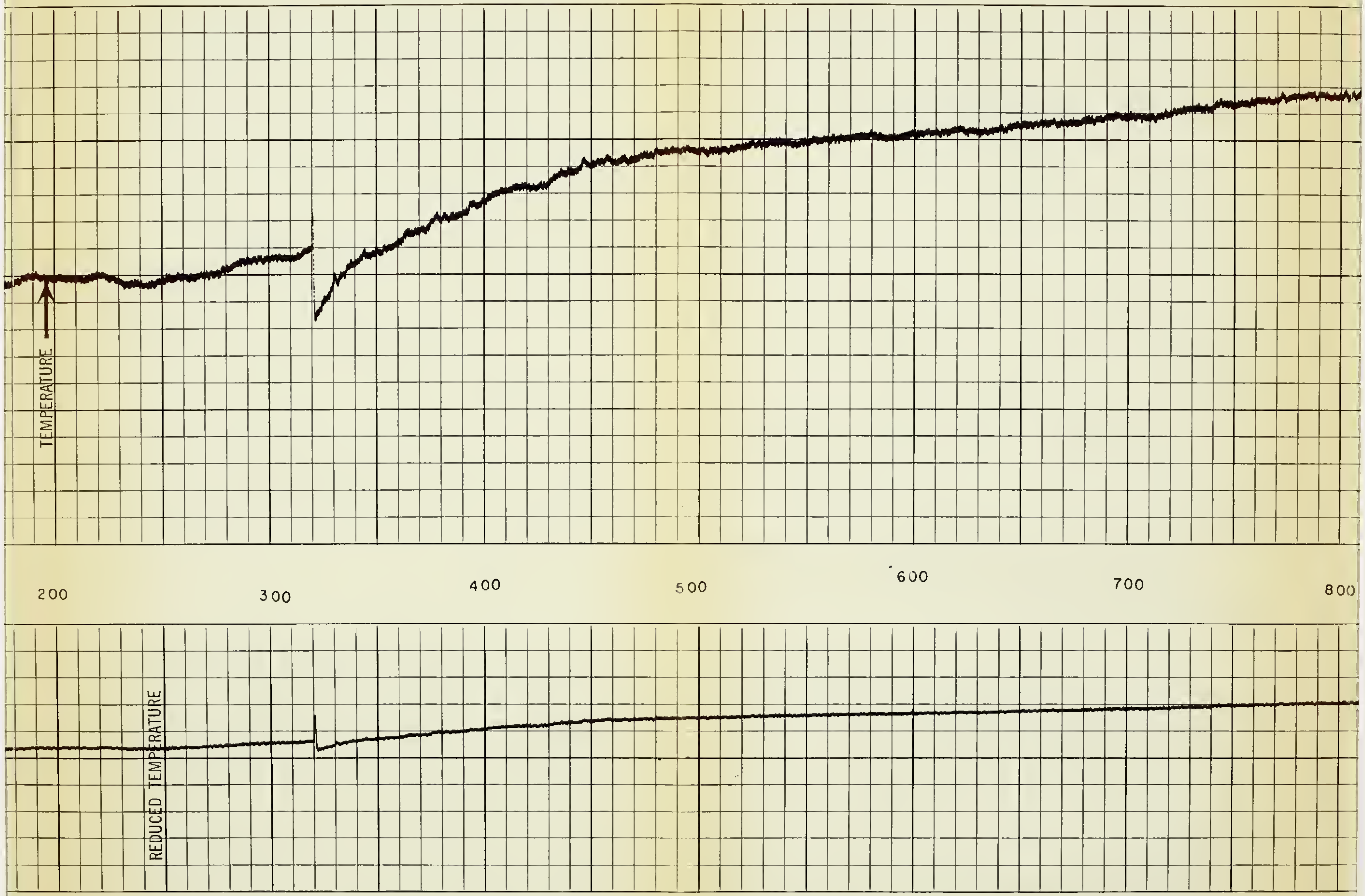
REMARKS: TEMPERATURE LOGGED ONE WEEK AFTER OTHER SERVICES- NO RIG ON LOCATION

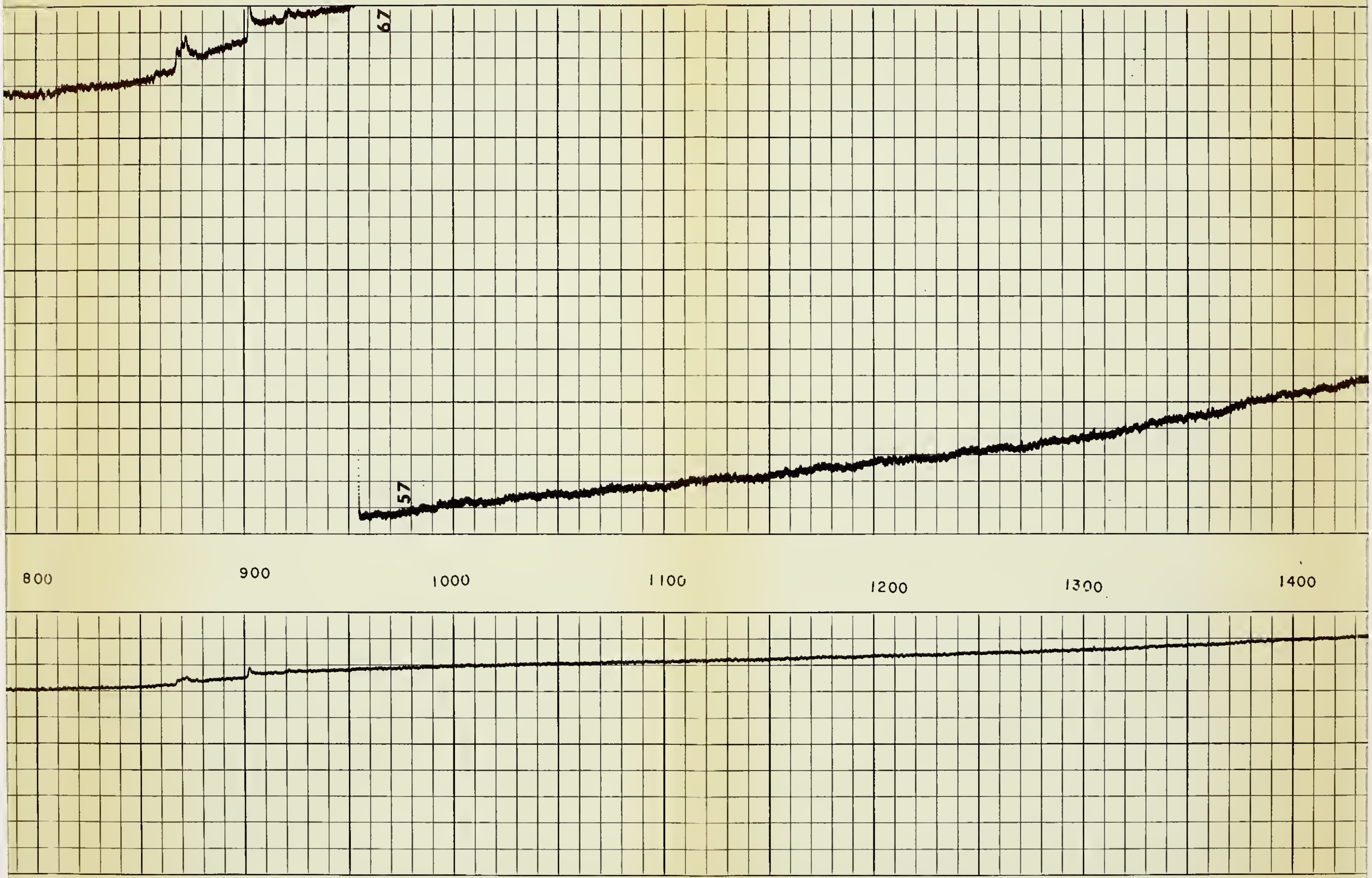
PPU-A 777K
HTU-B 730A
PAH-A 807
HTS-B 787

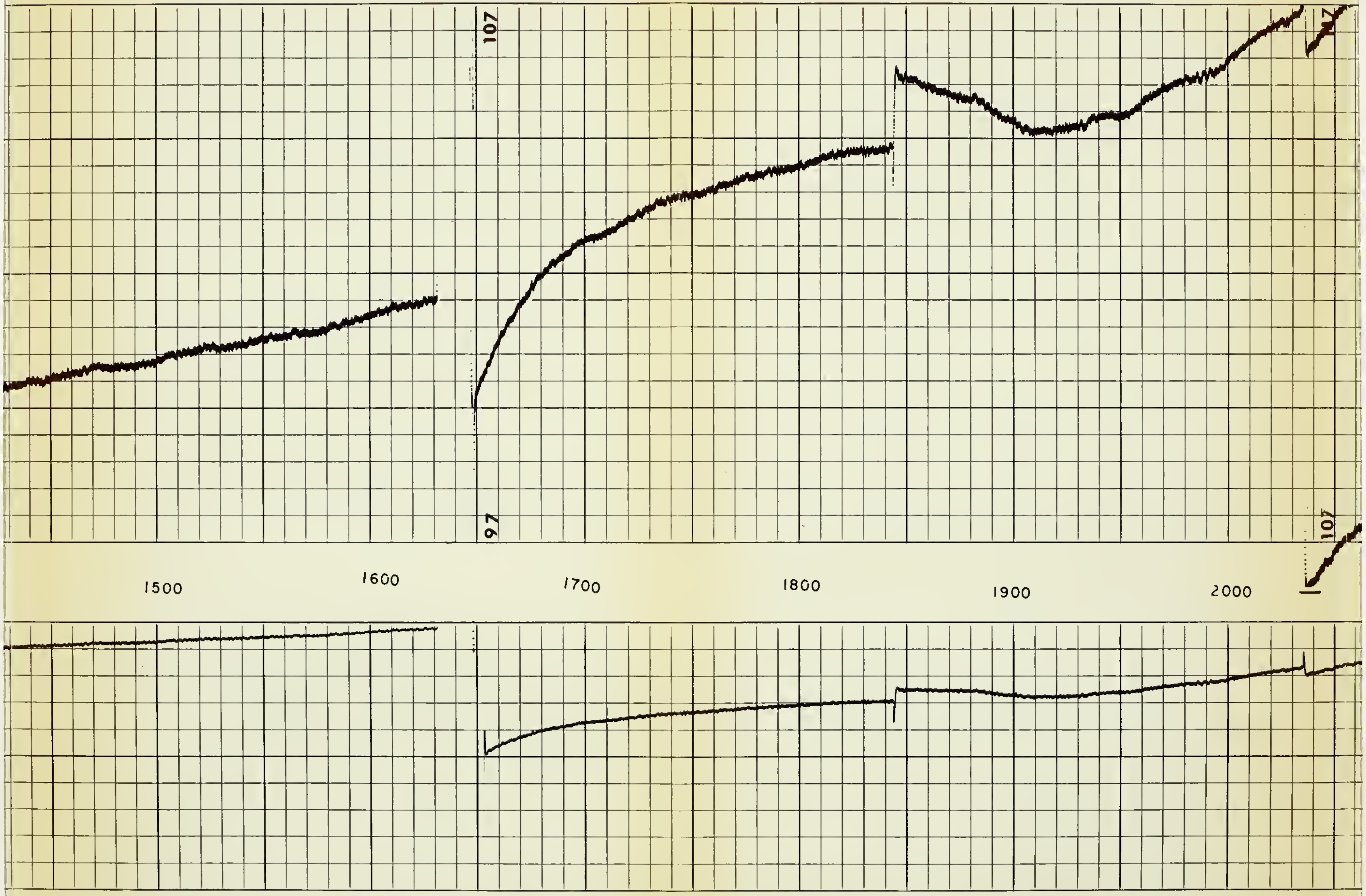
CEMENTATION DATA

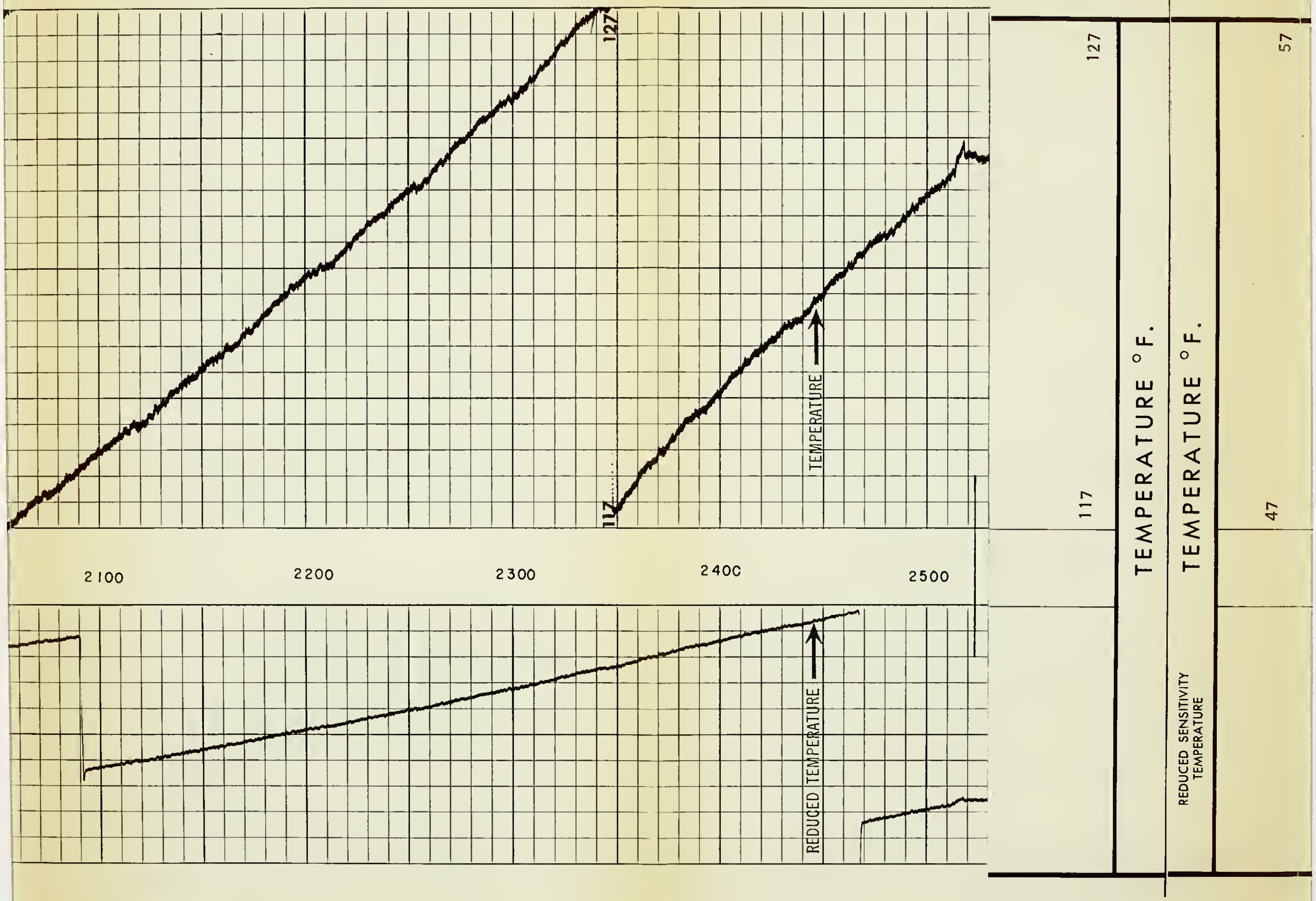
Date	Depth	Type of Cement	Nb of Sacks	Additives	Calculated Top

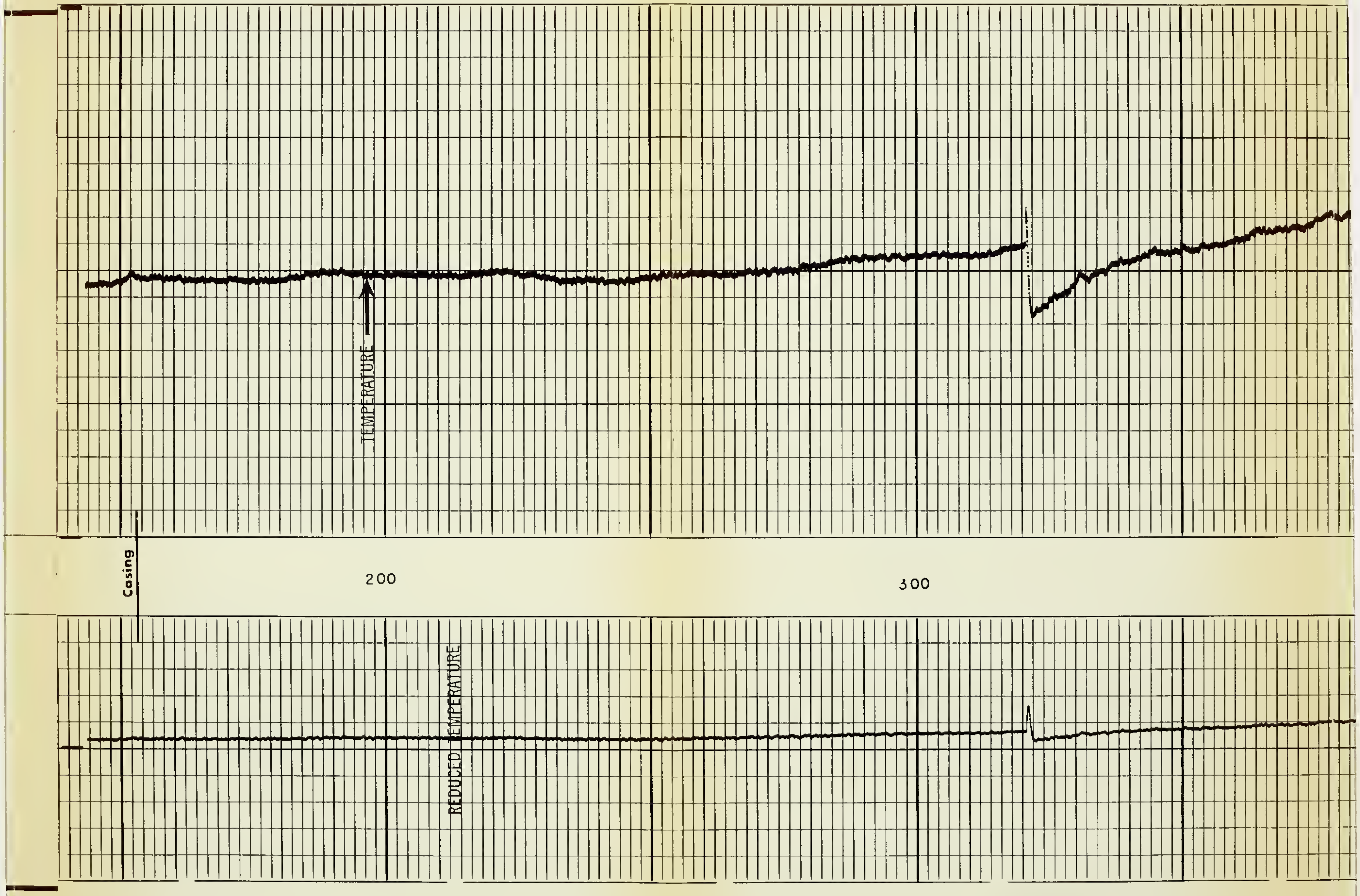


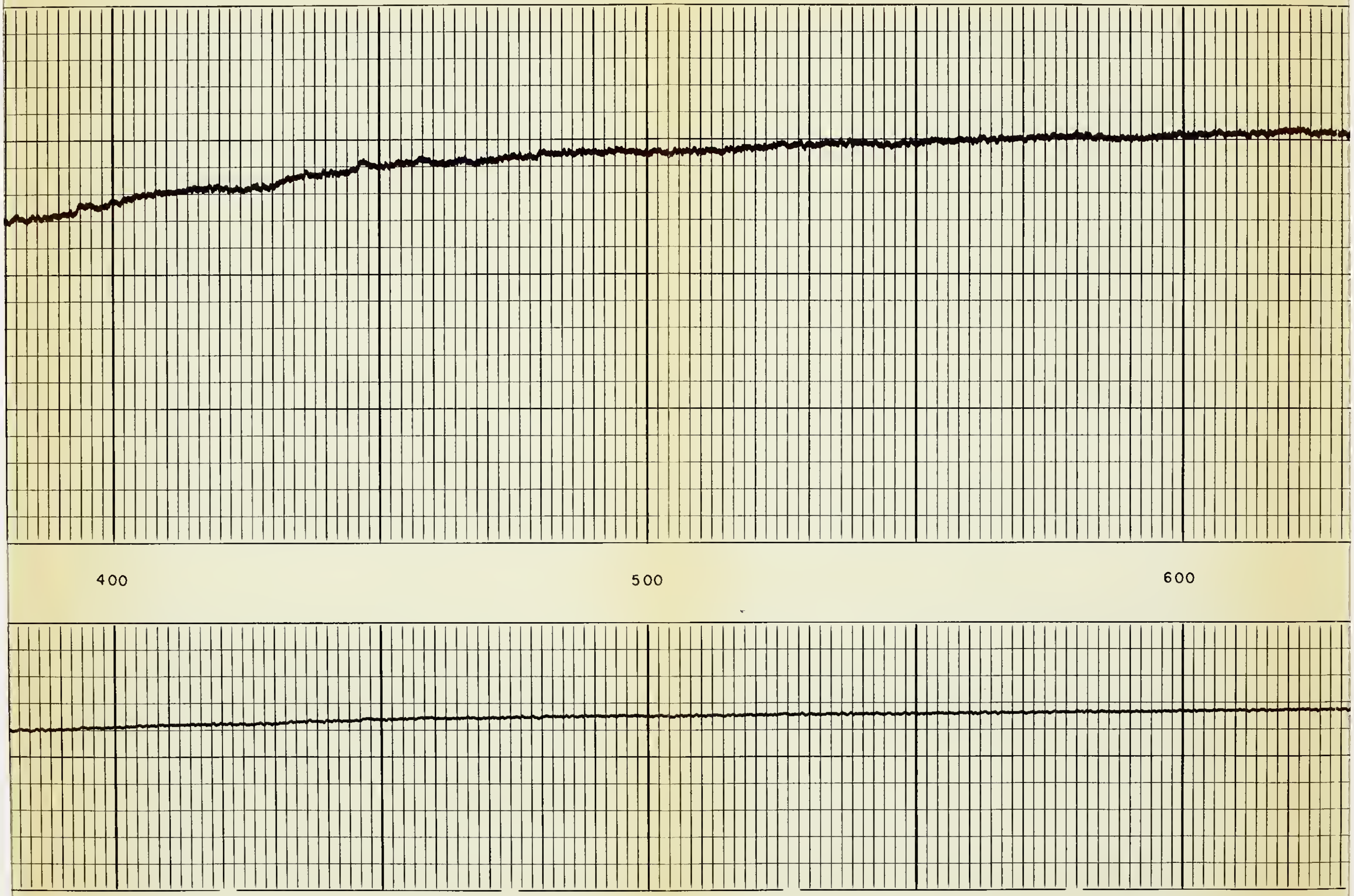

TEMPERATURE
200
300
400
500
600
700
800
REDUCED TEMPERATURE

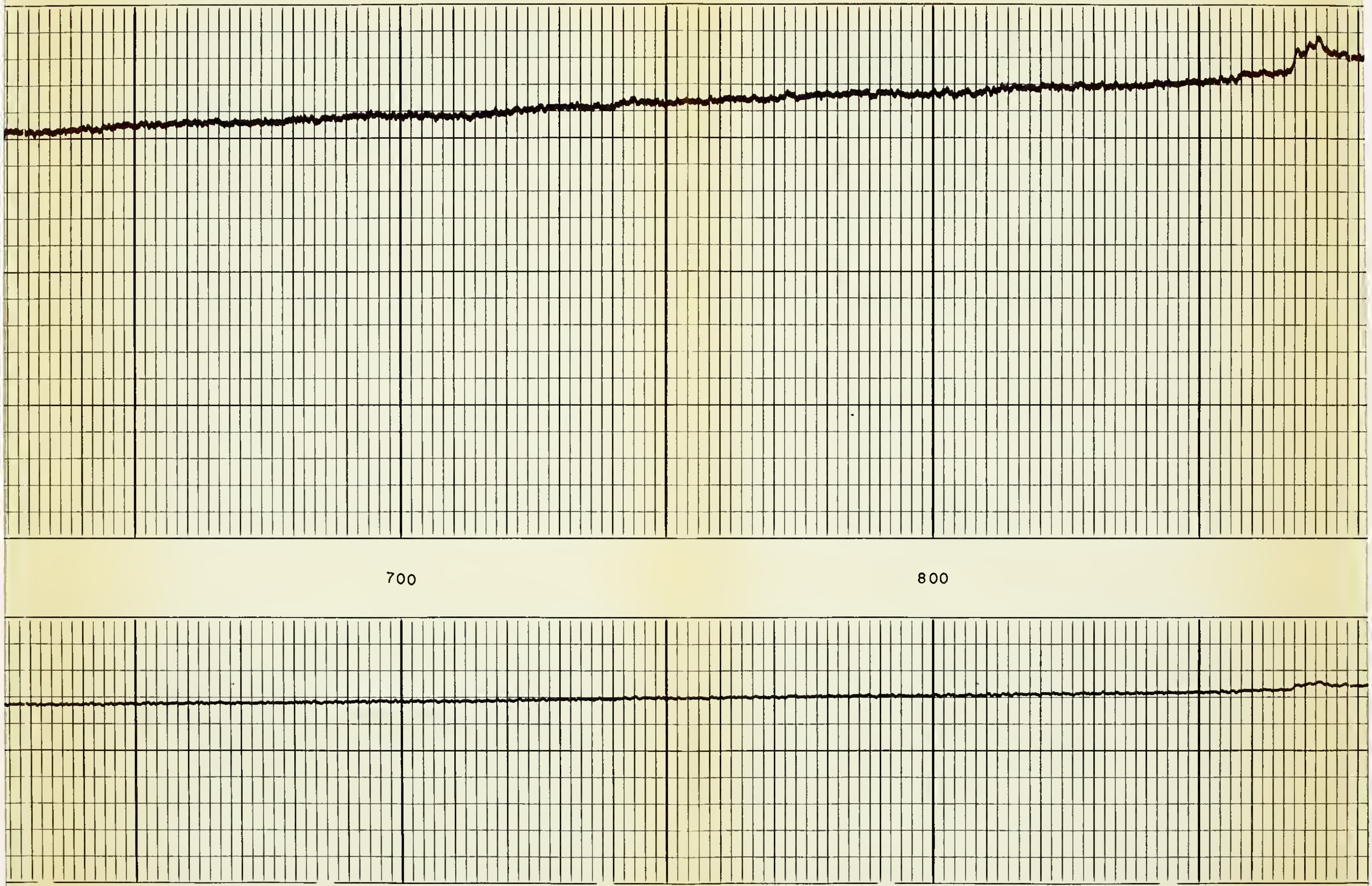

67
57
800
900
1000
1100
1200
1300
1400

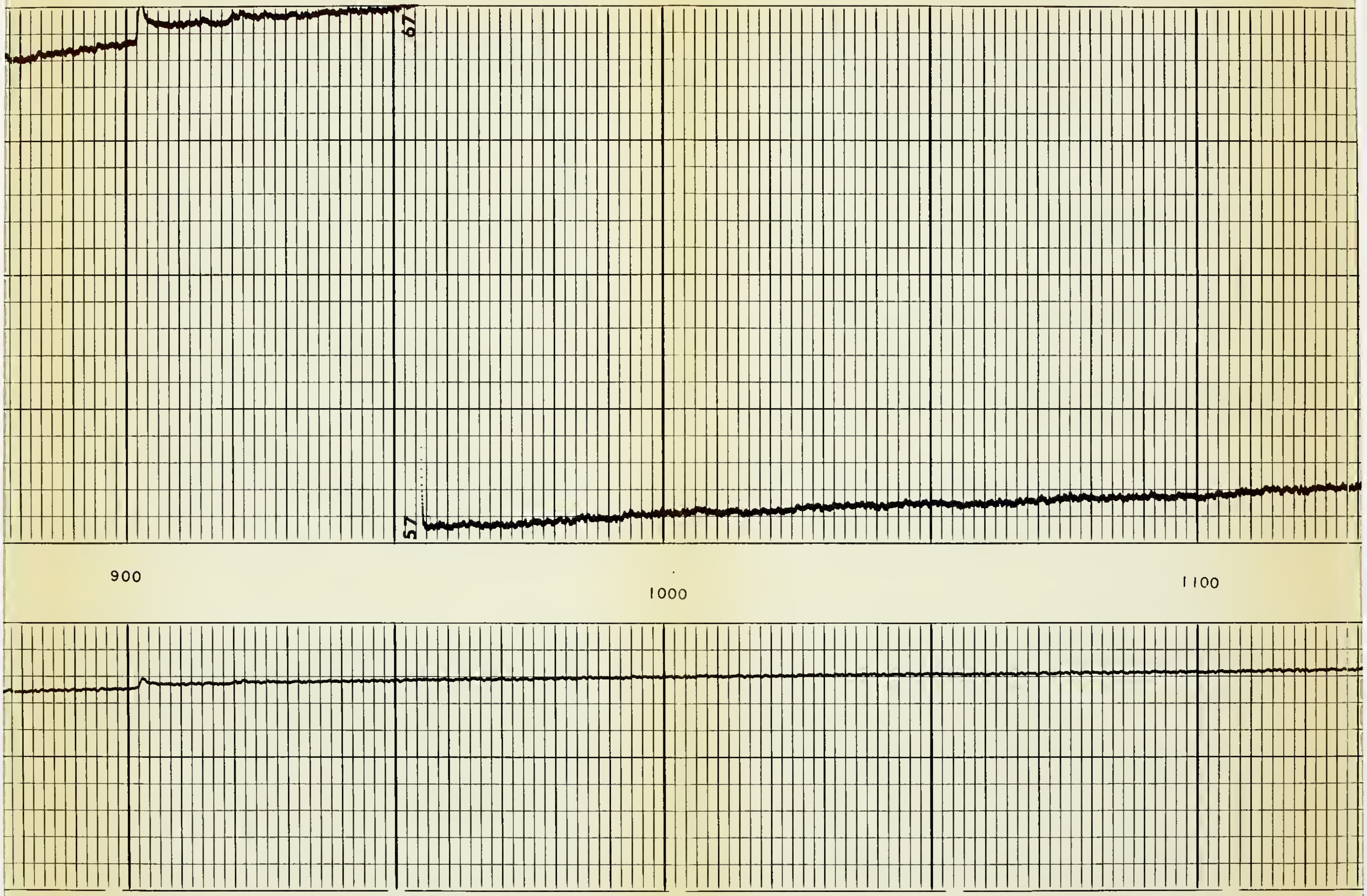

107
97
1500
1600
1700
1800
1900
2000
107
107

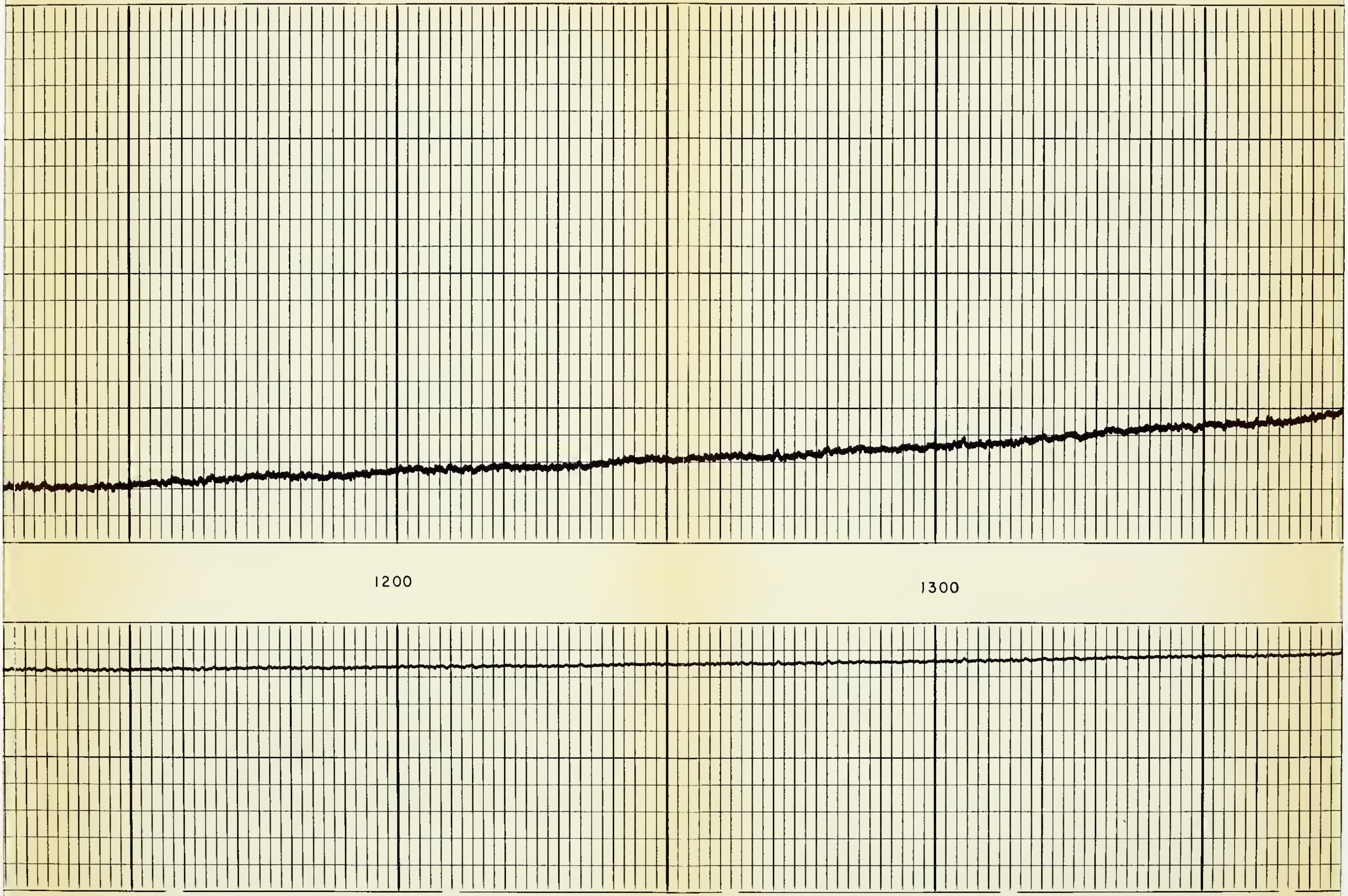

127
117
TEMPERATURE
REDUCED TEMPERATURE
2100
2200
2300
2400
2500
127
117
TEMPERATURE °F.
57
47
TEMPERATURE °F.
REDUCED SENSITIVITY TEMPERATURE

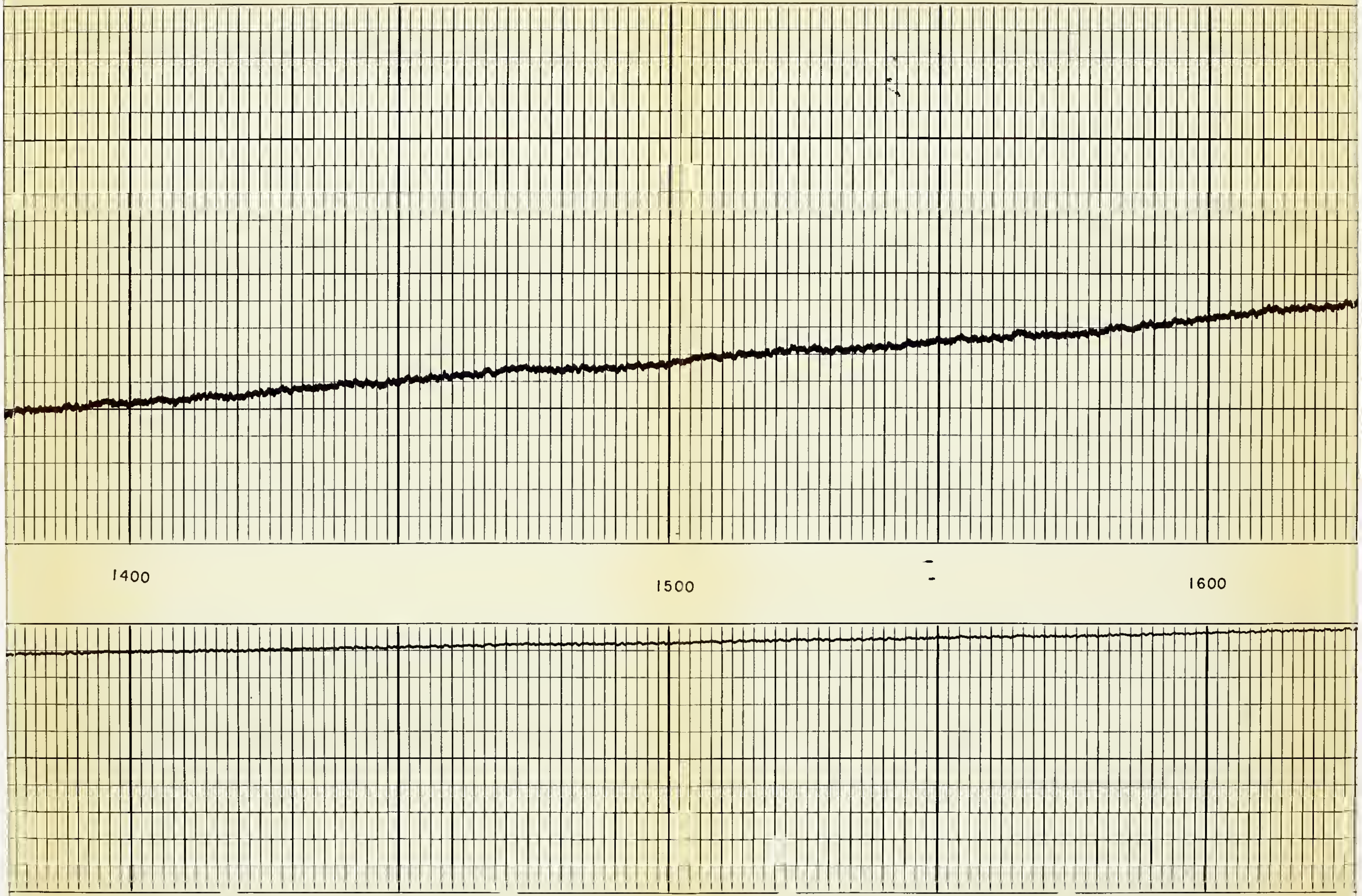

TEMPERATURE
Casing
200
300
REDUCED TEMPERATURE

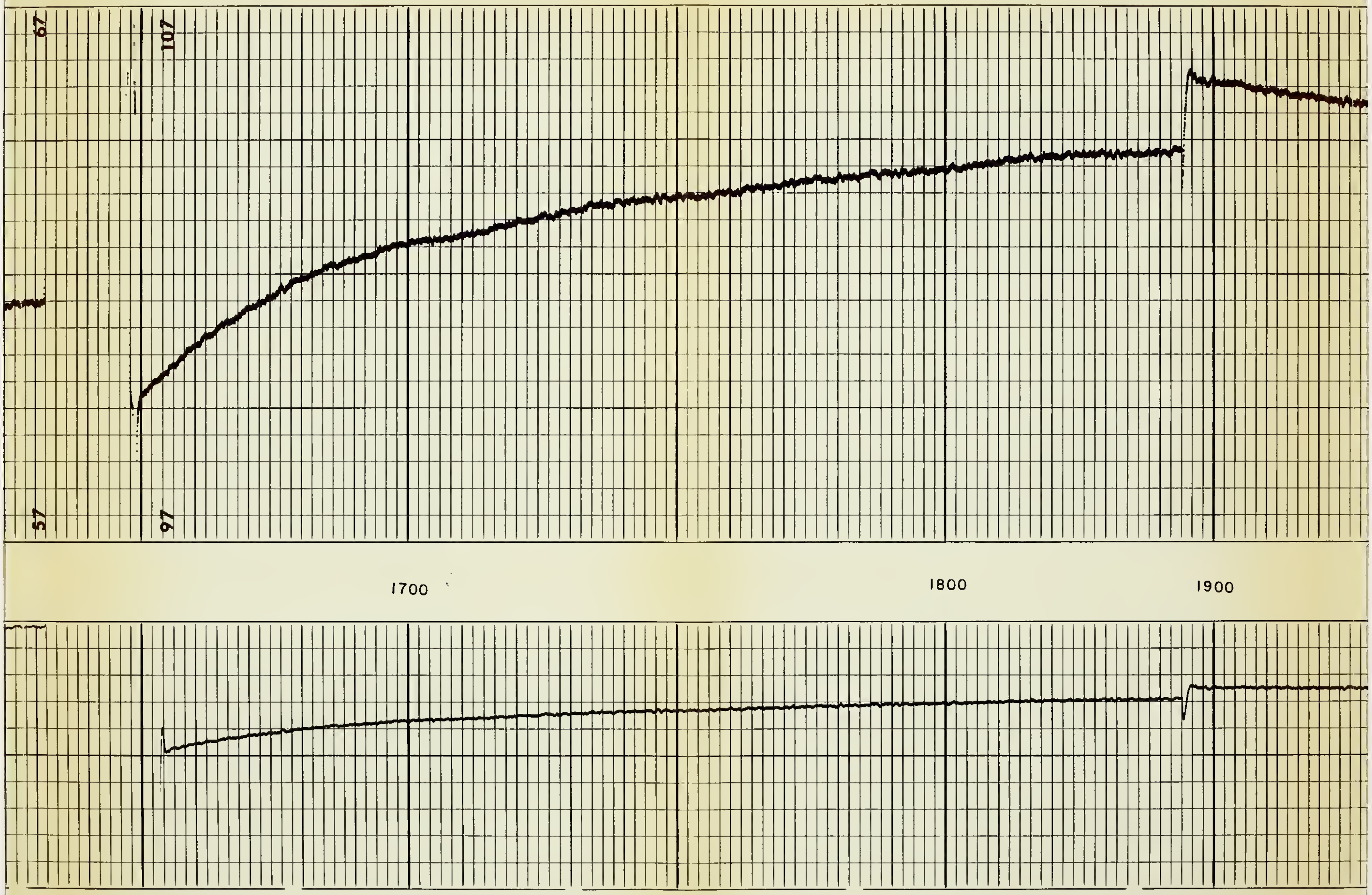

400
500
600

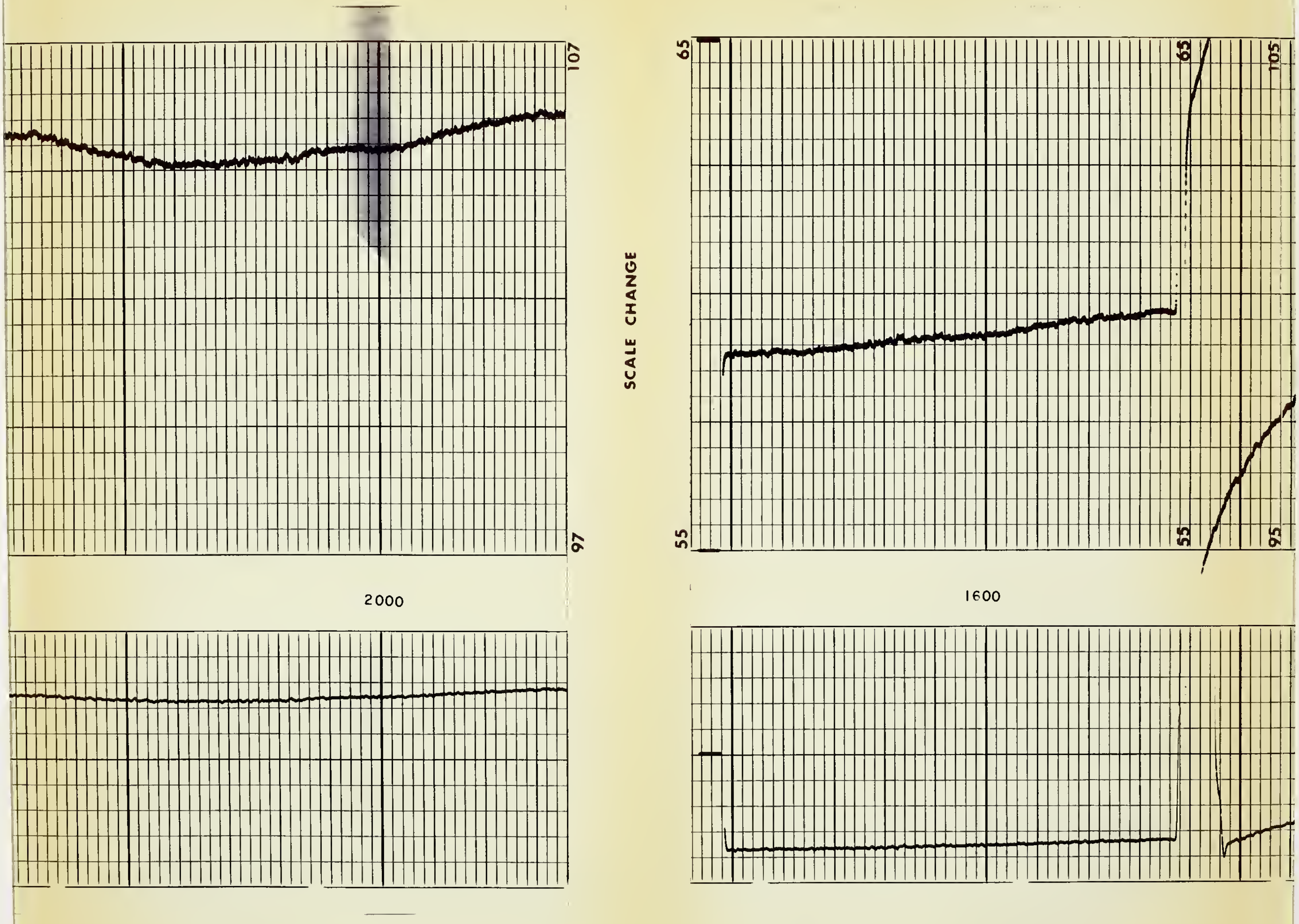

700
800

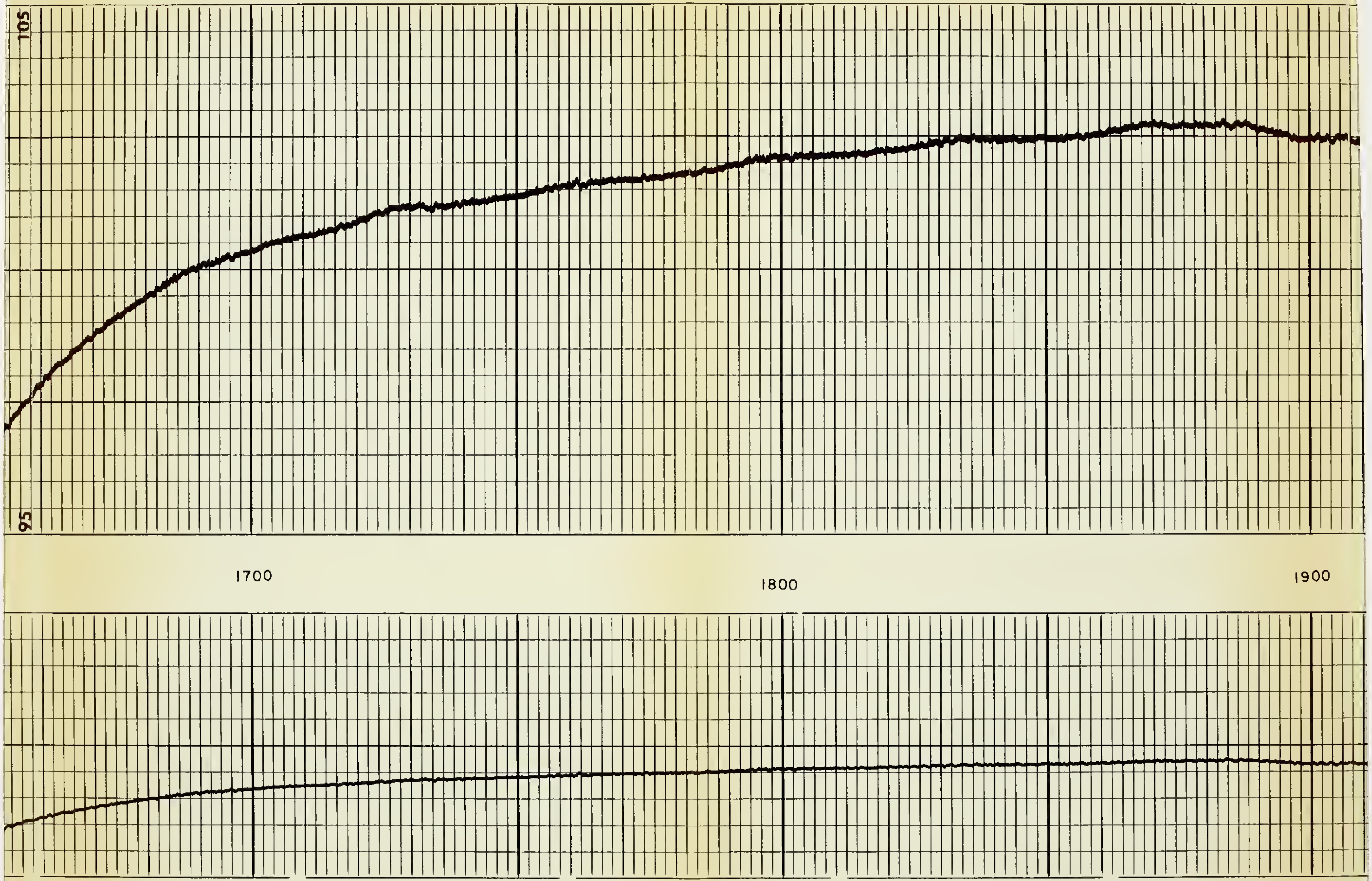

67
57
900
1000
1100

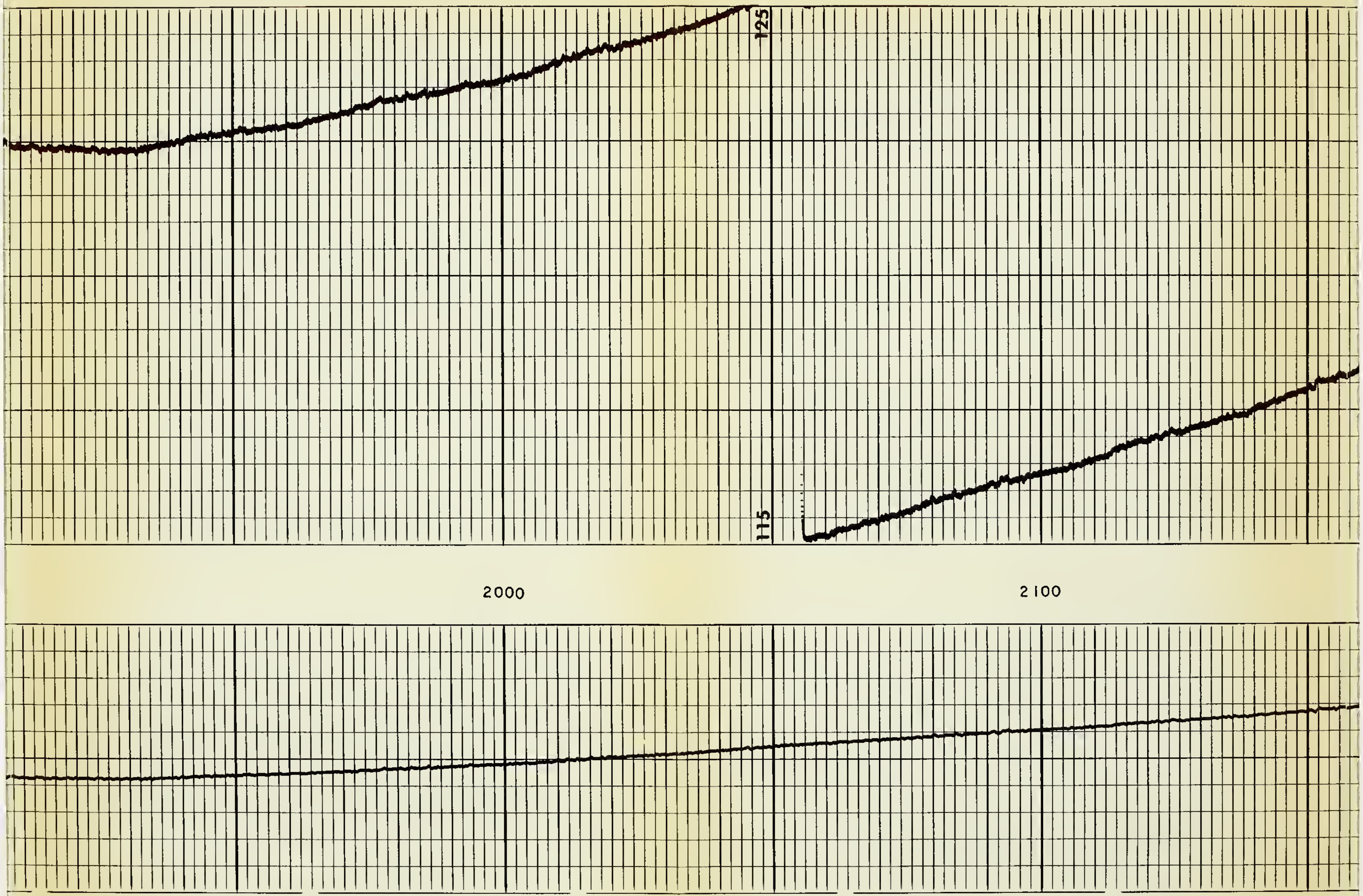

1200
1300

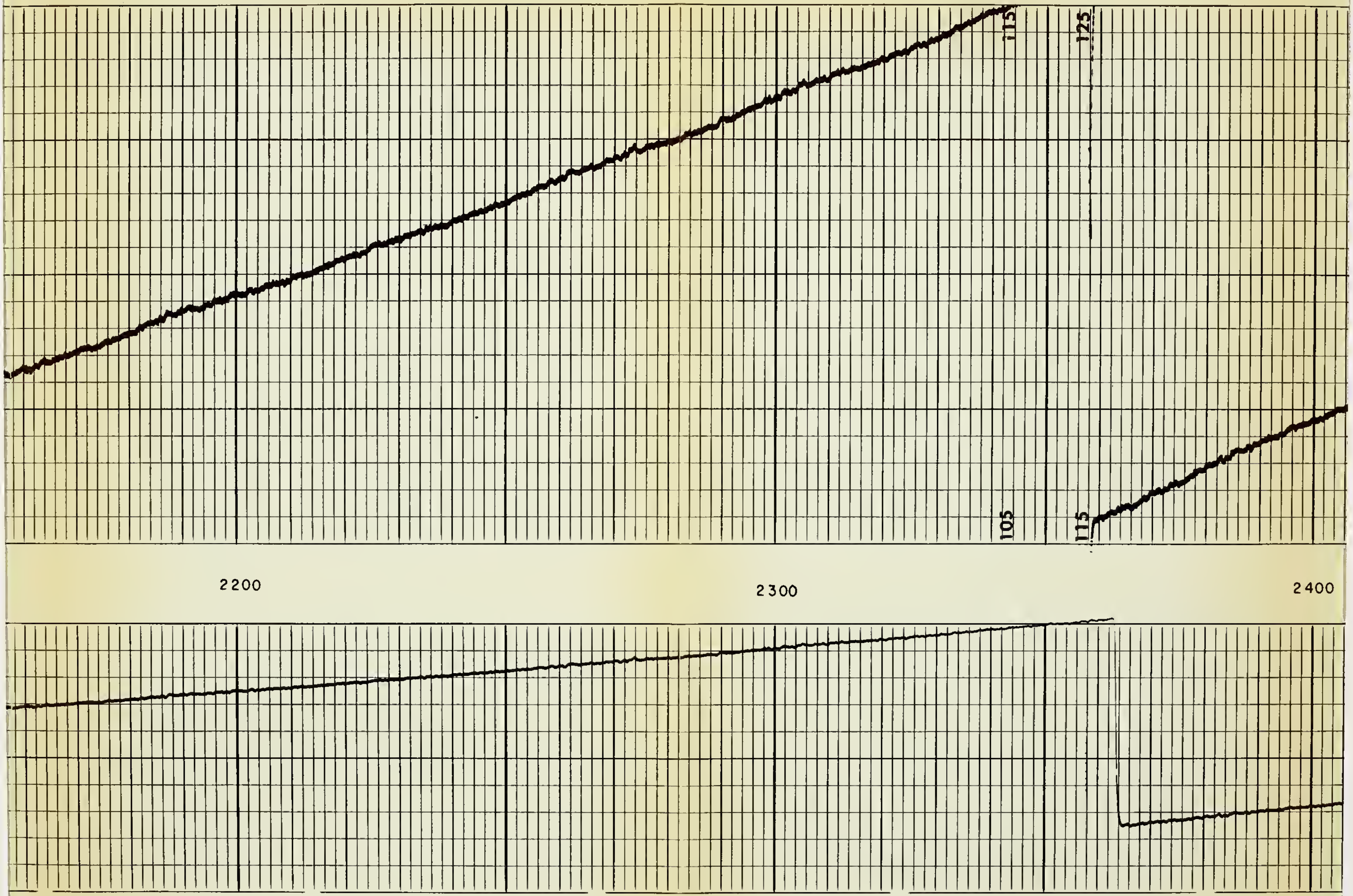

1400
1500
1600

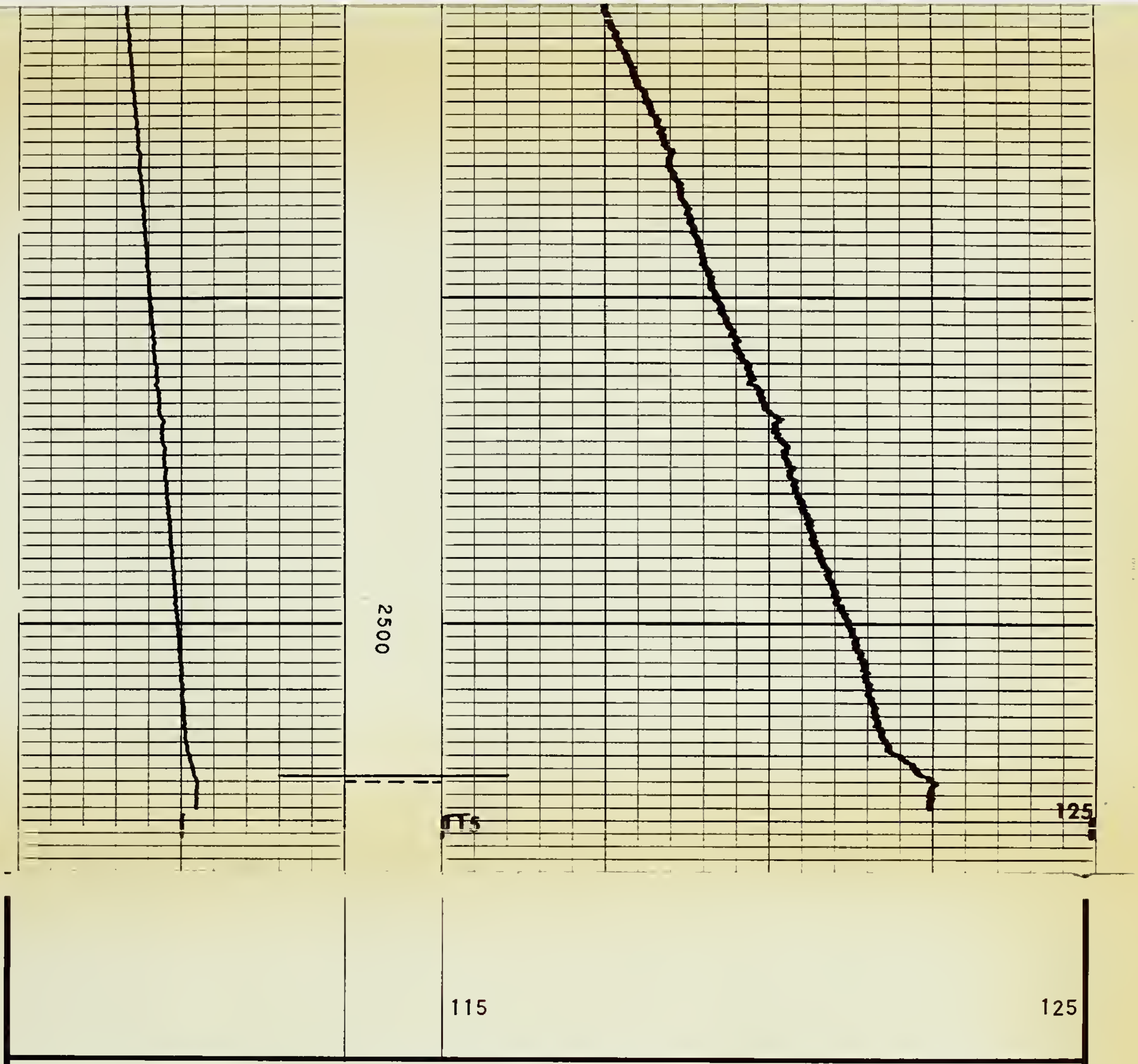

67
57
107
97
1700
1800
1900


107
97
2000
SCALE CHANGE
65
55
65
55
105
95
1600


105
95
1700
1800
1900


125
115
2000
2100


115
125
105
115
2200
2300
2400



TEMPERATURE °F.

COMPANY	ATLANTIC FICHFIELD COMPANY	SCHL. F. R.	2523
WELL	SORGHUM GULCH NO. 1	SCHL. T. D.	2524
		DRLR. T. D.	2525
FIELD	SORGHUM GULCH		
COUNTY	RIO BLANCO	STATE	COLORADO

CORèHOLE SG-1a

Schlumberger

COMPENSATED FORMATION DENSITY LOG
Gamma-Gamma

COUNTY	RIO BLANCO
FIELD or LOCATION	SORGHUM GULCH
WELL	SORGHUM GULCH 1-A
COMPANY	ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH 1-A

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

Location: API Serial No.

Sec. 2 Twp. 3S Rge. 97W

Other Services: NONE

Permanent Datum: GL ; Elev.:
Log Measured From GL , Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B.
D.F.
G.L.

Date	1/20/75			
Run No.	ONE			
Depth—Driller	938			
Depth—Logger	938			
Btm. Log Interval	937			
Top Log Interval	80			
Casing—Driller	7" @ 225	@	@	@
Casing—Logger	230			
Bit Size	6-1/4			
Type Fluid in Hole	WATER			
Fluid Level	150'			
Dens. | Visc.				
pH | Fluid Loss	ml	ml	ml	ml
Source of Sample	PIT			
Rm @ Meas. Temp.	7.6 @ 61 °F	@ °F	@ °F	@ °F
Rmf @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source: Rmf | Rmc				
Rm @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.				
Max. Rec. Temp.	6 °F	°F	°F	°F
Equip. | Location	5602 | G. J.			
Recorded By	GEIGER			
Witnessed By	BURNS			

SWS-1381-H

The well name, location and borehole reference data were furnished by the customer.

FOLD HERE

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.		
Depth - Driller		
Type Fluid		
Source of Sample		
Rm @ Meas. Temp.	@ °F	@ °F
Rmf @ Meas. Temp.	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F
Rm @ BHT	@ °F	@ °F
Dens. | Visc.		
ph | Fluid Loss	ml	ml
% Water by Vol.		
% Oil by Vol.		
% Solids by Vol.		
Solids Av. Sp. Gr		

LOGGING DATA

FDC Selectors

Liquid Density	Grain Density	Hole Fluid	Porosity Scale	From	To

EQUIPMENT DATA

Run No.	ONE
Panel No.	169
Cart No.	299
Skid No.	436
Sonde No.	90
Source	3098
Calibrator	210
GR Cart.	209
TTR	
Mem Panel	235

REMARKS

Service Order No. - 22497

ELEVATION AND EXACT LOCATION WERE NOT AVAILABLE AT TIME OF LOGGING.

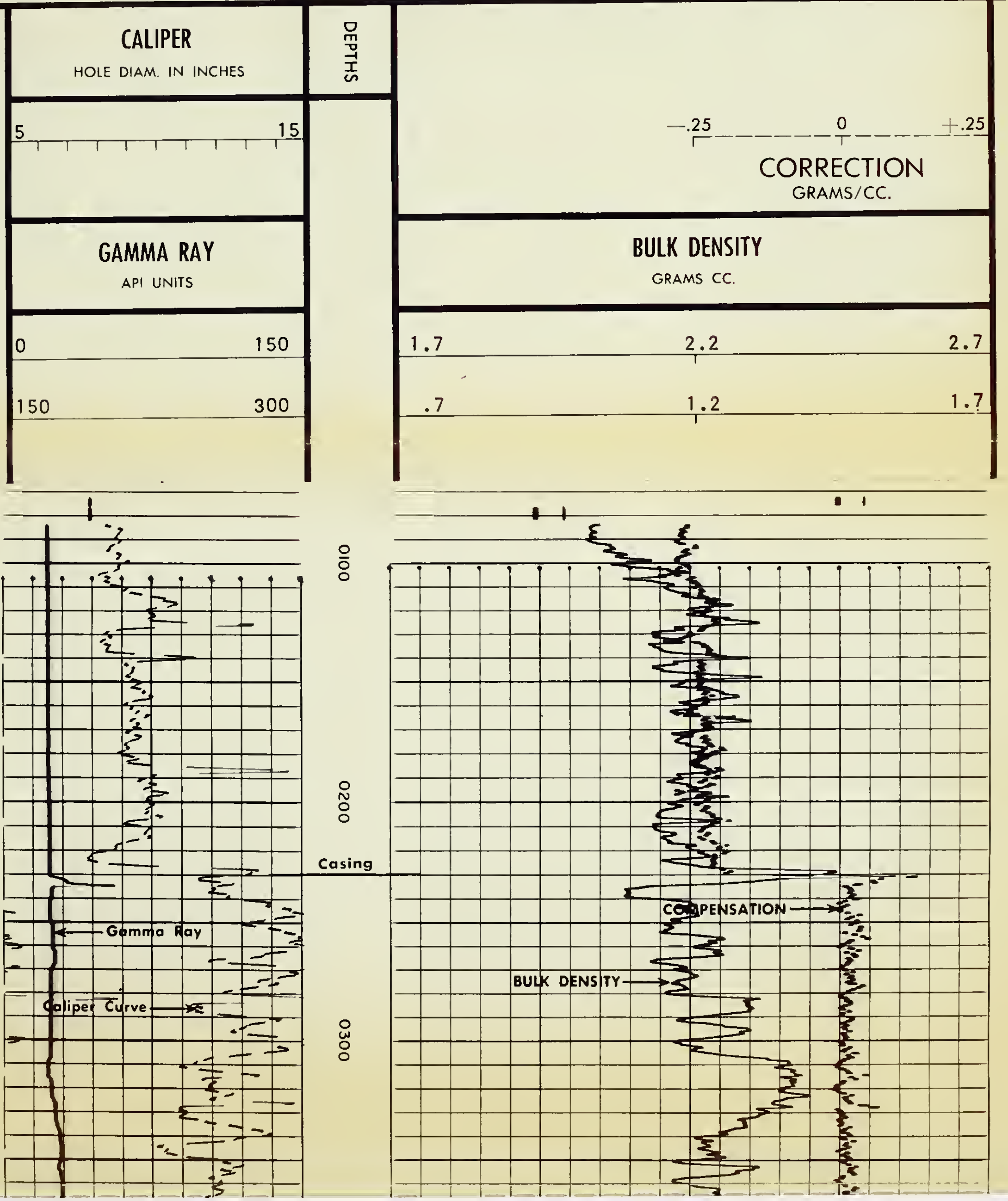
BIT SIZE/CASING DATA

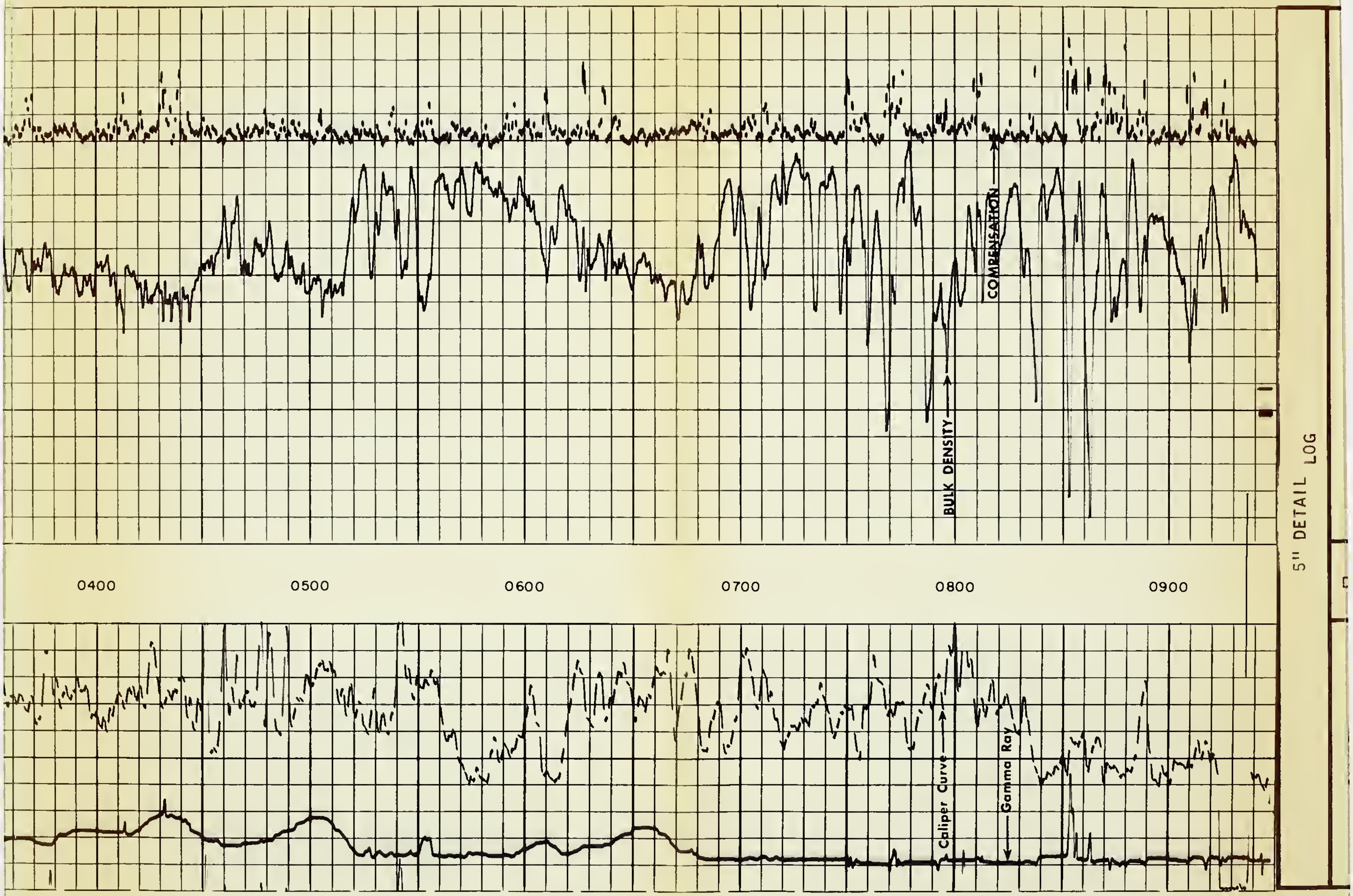
Bit	From	To	Csg. Size	Csg. Wt.	From	To
6-1/4	150	938	7"	20#	SURF	225

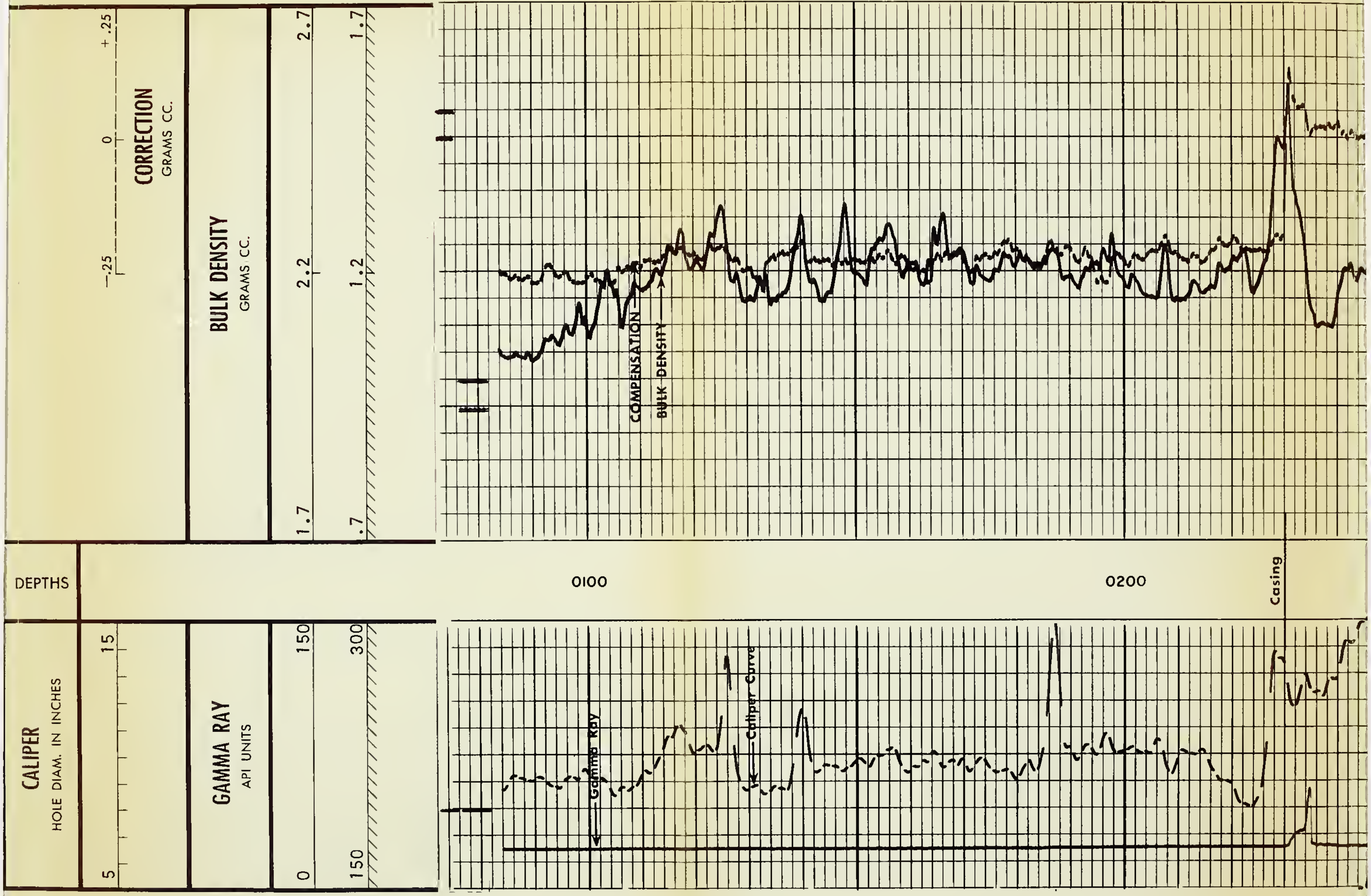
CALIBRATION DATA

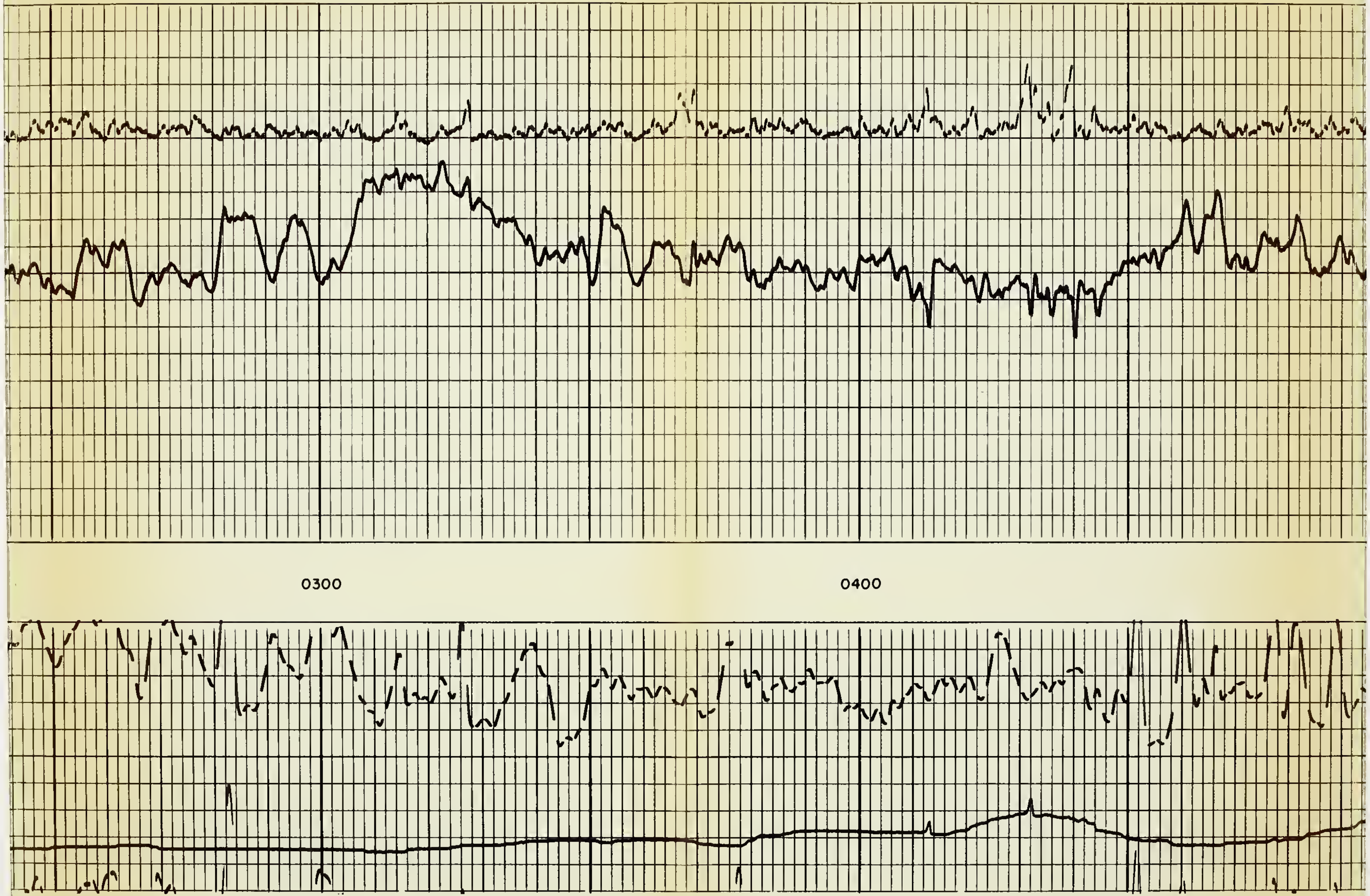
Run No.	Gamma Ray			FDC — Before Log — ACPS		FDC — After Log — ACPS	
	API Scale	Background CPS	Total CPS	P_1	P_2	P_1	P_2
1	0-200	150	610	550	930	545	930
2							
3							
4				BLOCK CAL	560	940	

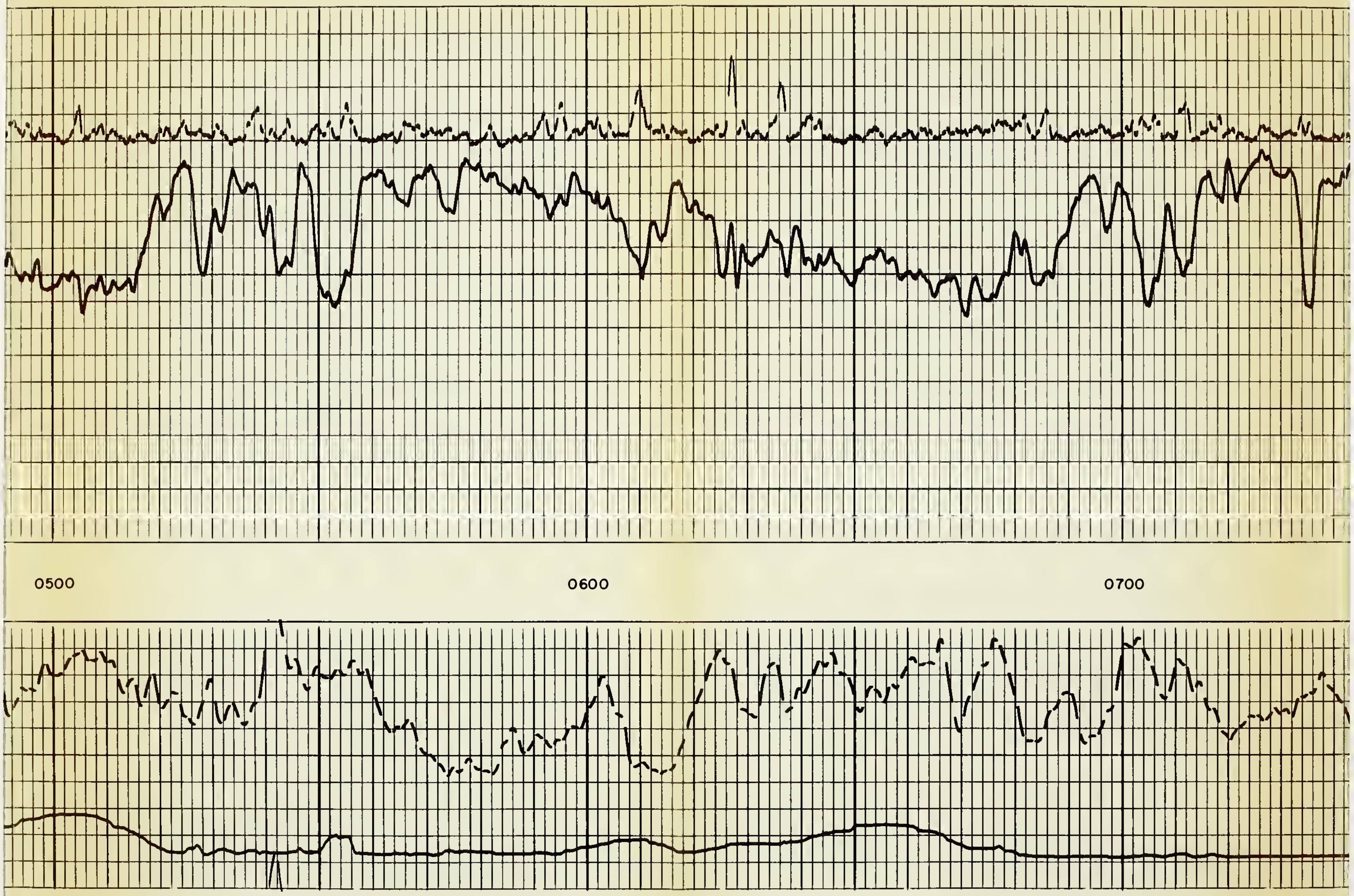
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

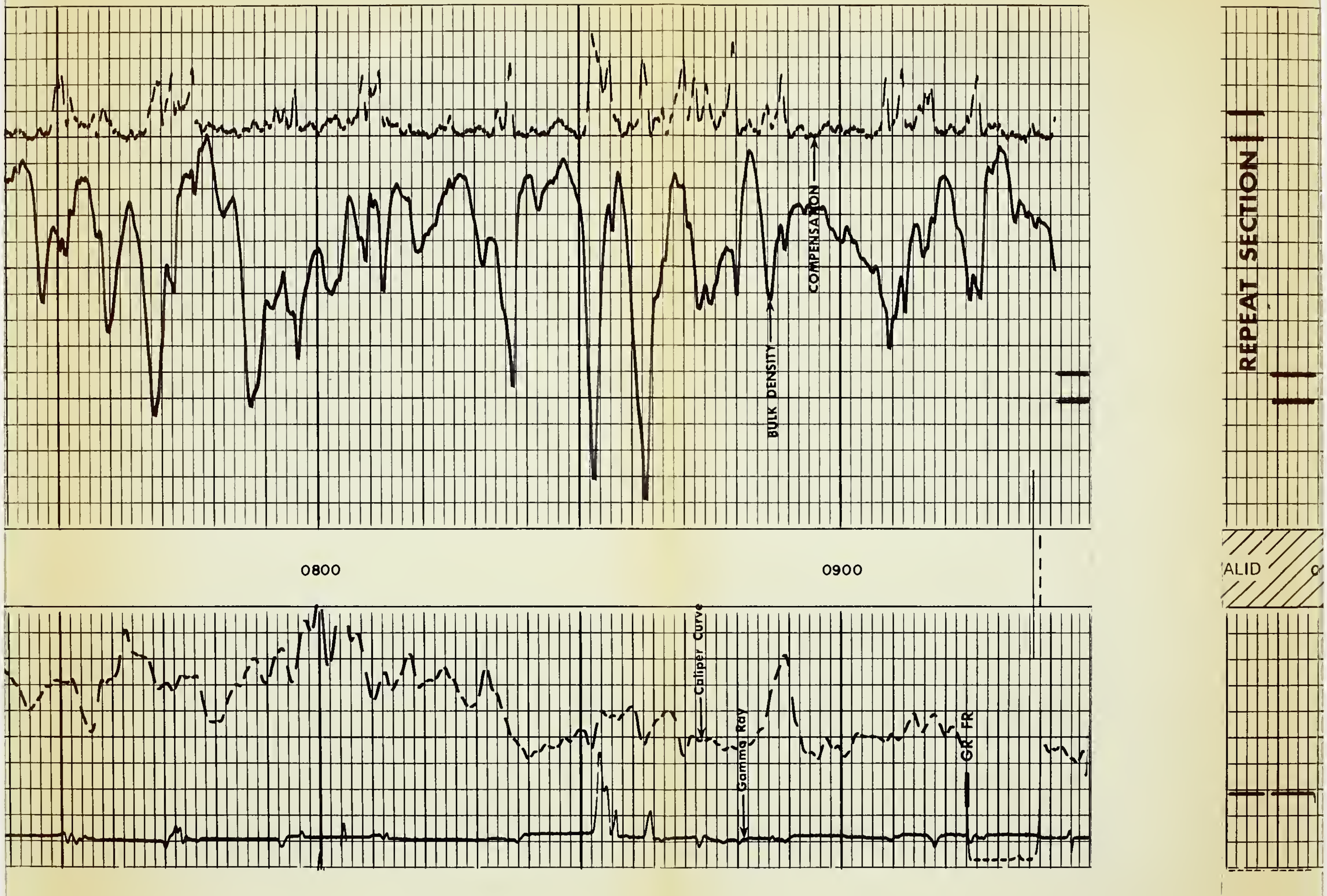


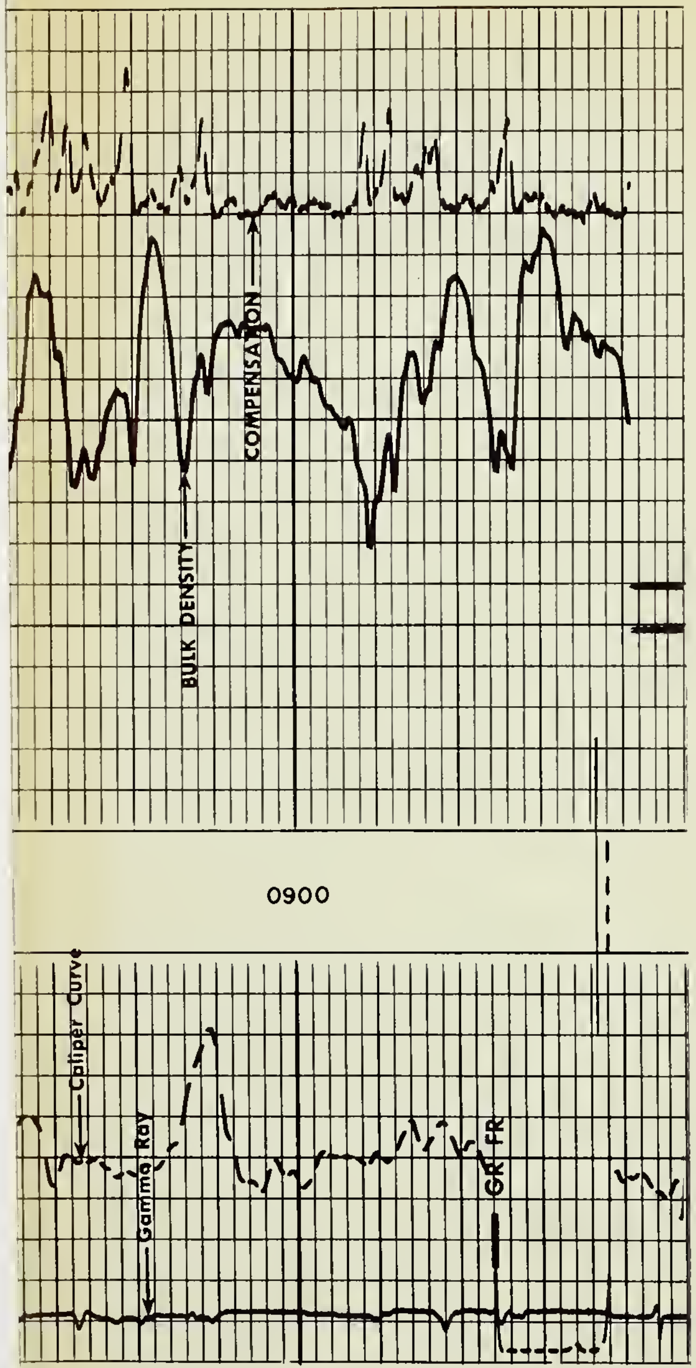

COMPENSATION
BULK DENSITY
0400
0500
0600
0700
0800
0900
Caliper Curve
Gamma Ray
5" DETAIL LOG

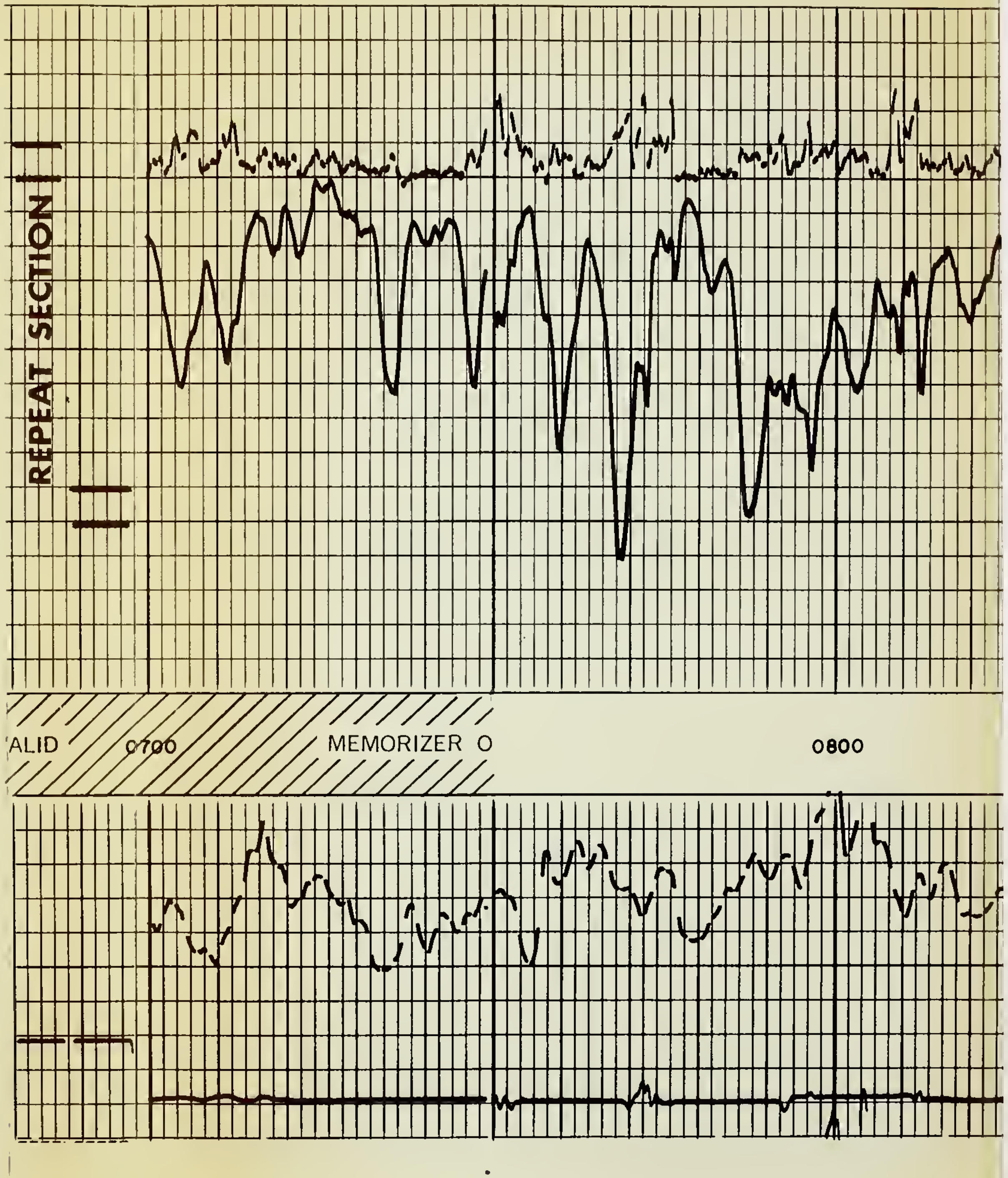

CORRECTION
GRAMS CC.
-.25
0
+.25
BULK DENSITY
GRAMS CC.
1.7
2.2
2.7
.7
1.2
1.7
COMPENSATION
BULK DENSITY
DEPTHS
0100
0200
Casing
CALIPER
HOLE DIAM. IN INCHES
5
15
GAMMA RAY
API UNITS
0
150
150
300
Gamma Ray
Caliper Curve

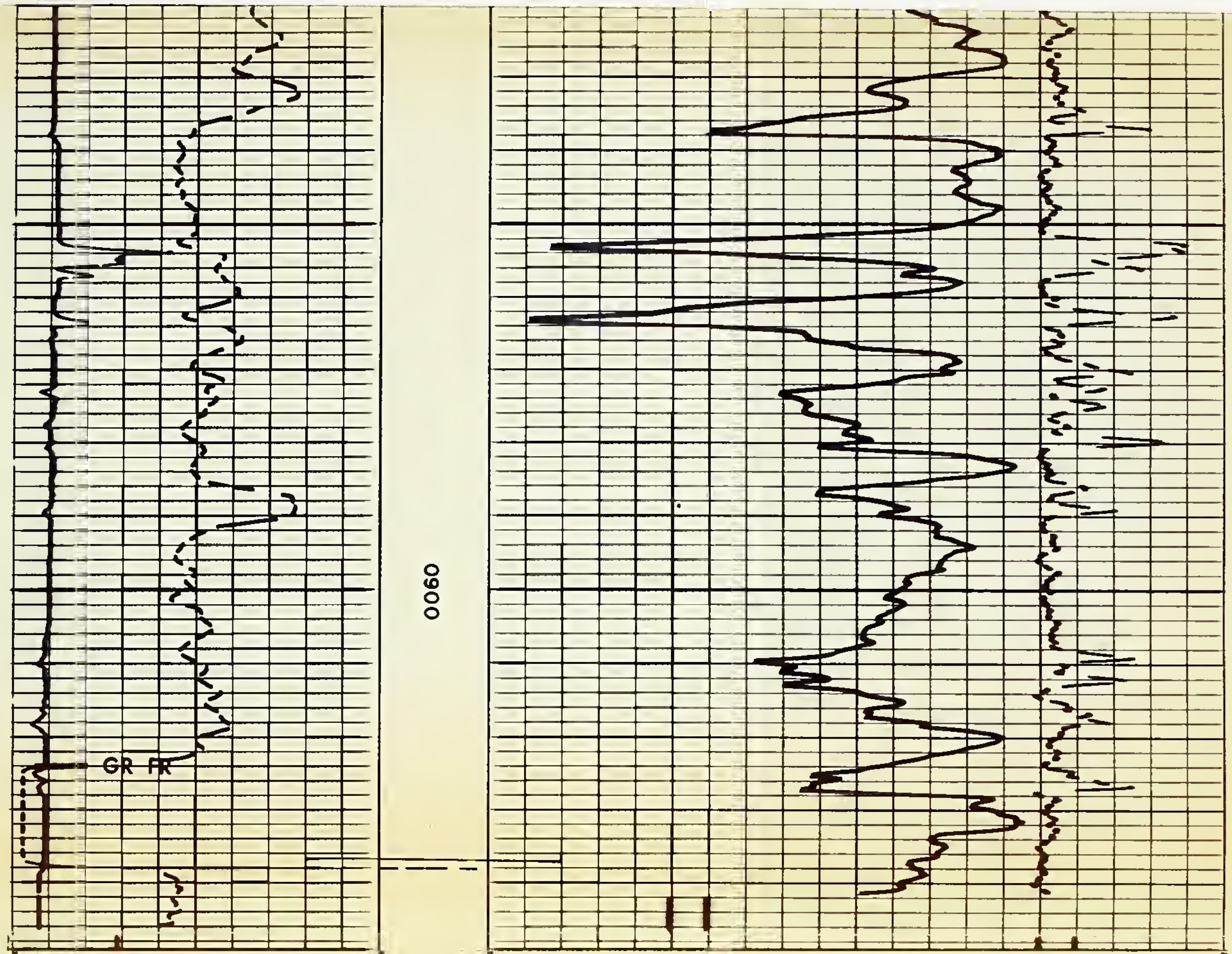

0300
0400


0500
0600
0700


BULK DENSITY
COMPENSATION
REPEAT SECTION
0800
0900
ALID
Caliper Curve
Gamma Ray
GR FR


COMPENSATION
BULK DENSITY
0900
Caliper Curve
Gamma Ray
GR FR


REPEAT SECTION
ALID
0700
MEMORIZER O
0800



0 150 1.7 2.2 2.7

150 300 .7 1.2 1.7

GAMMA RAY
API UNITS

BULK DENSITY
GRAMS CC.

5 15 −.25 0 +.25

CORRECTION
GRAMS CC.

CALIPER
HOLE DIAM. IN INCHES

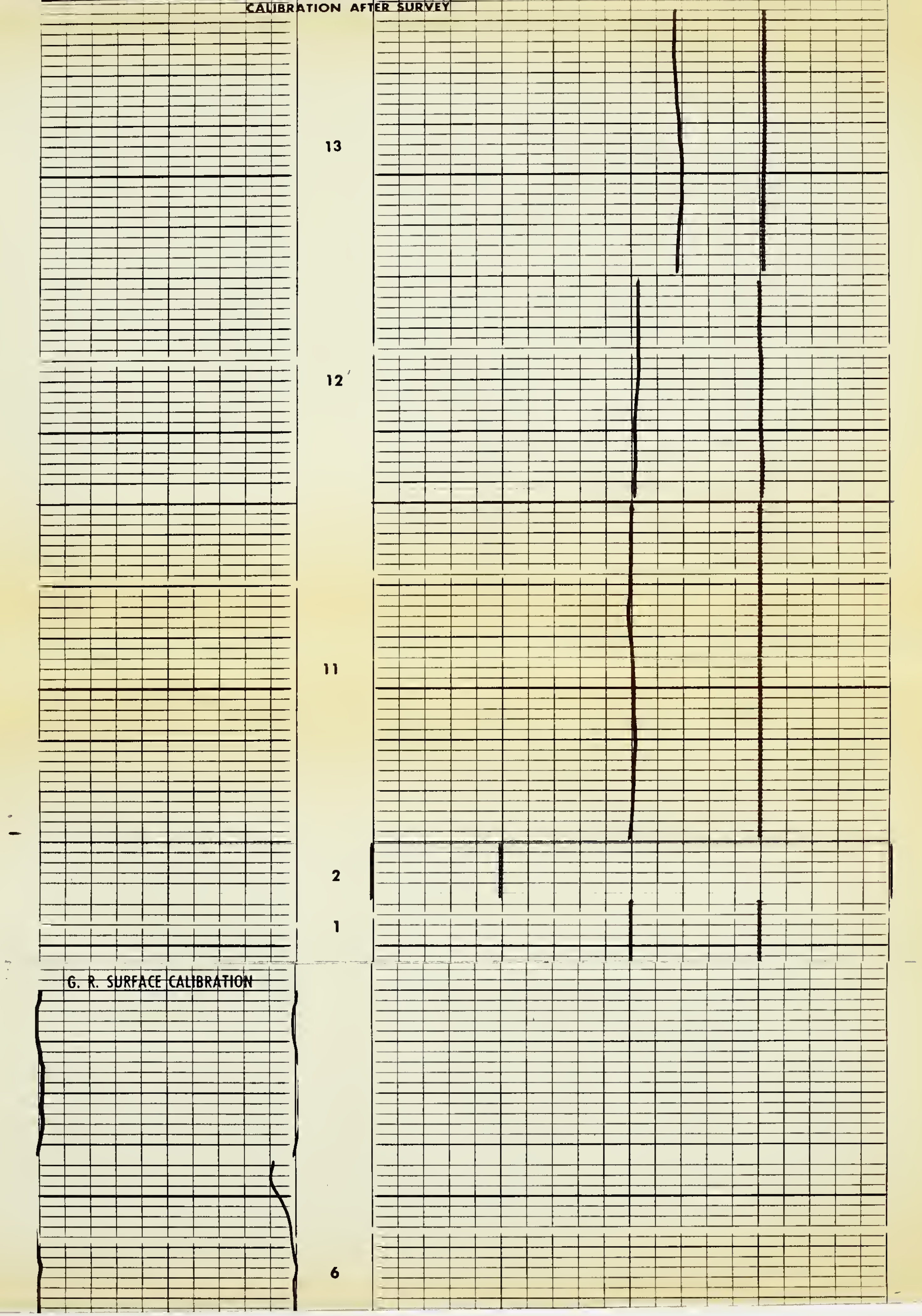
DEPTHS

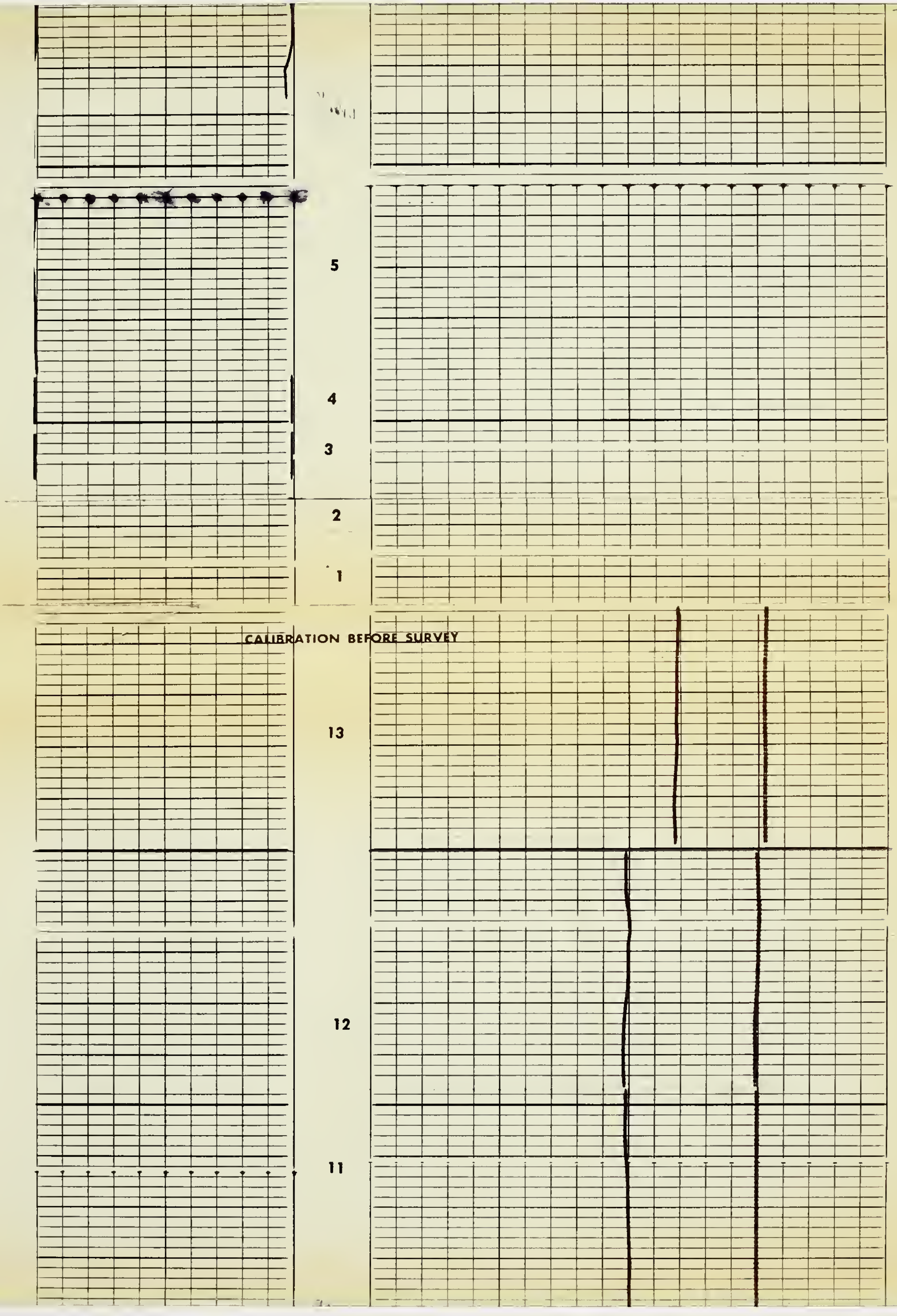
COMPANY ATLANTIC RICHFIELD CO.
WELL SORGHUM GULCH 1-A
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

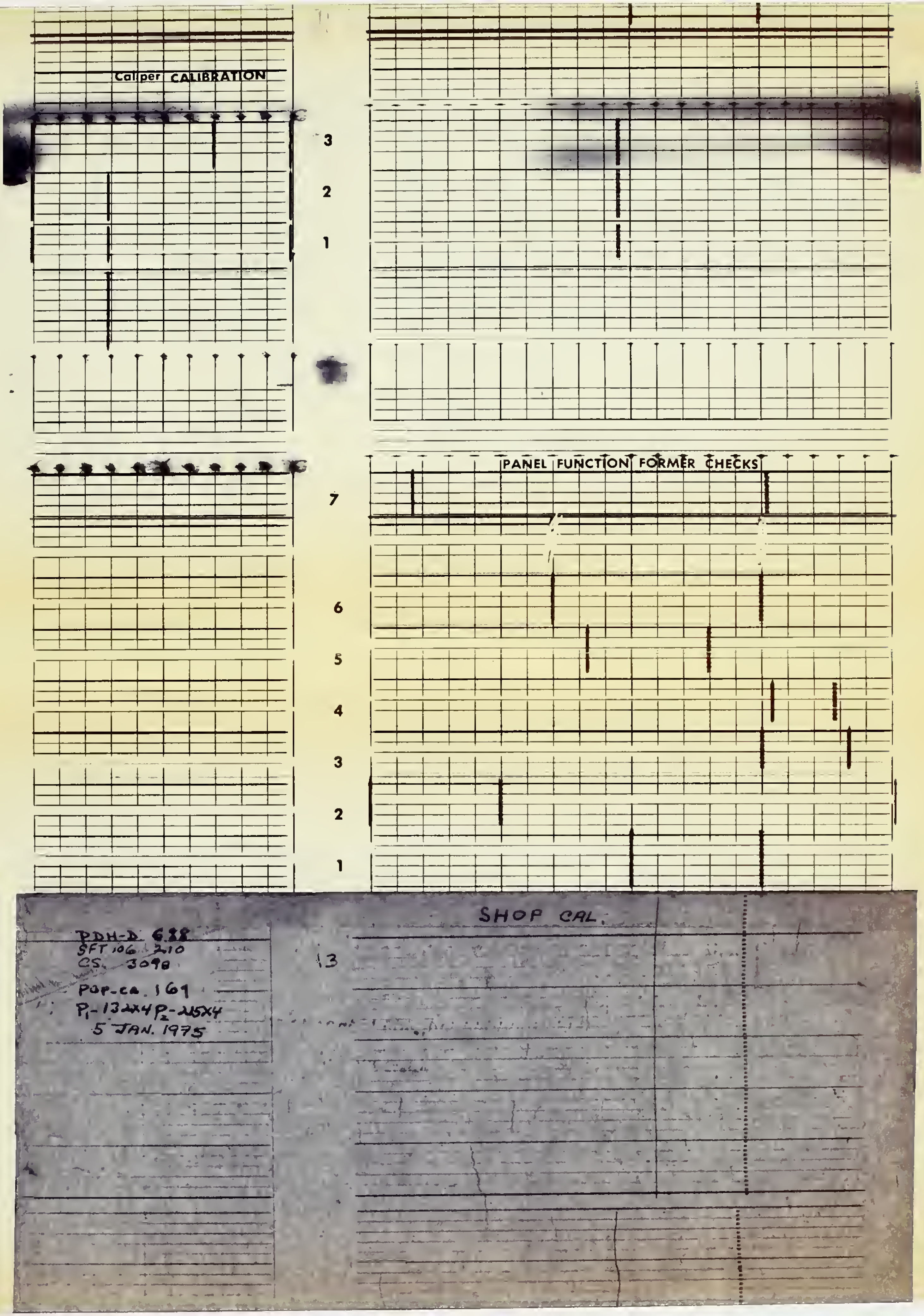
SCHL. FR 937
SCHL. TD 938
DRLR TD 938
Elev:
KB ----
DF -----
GL ----

CALIBRATION RECORD

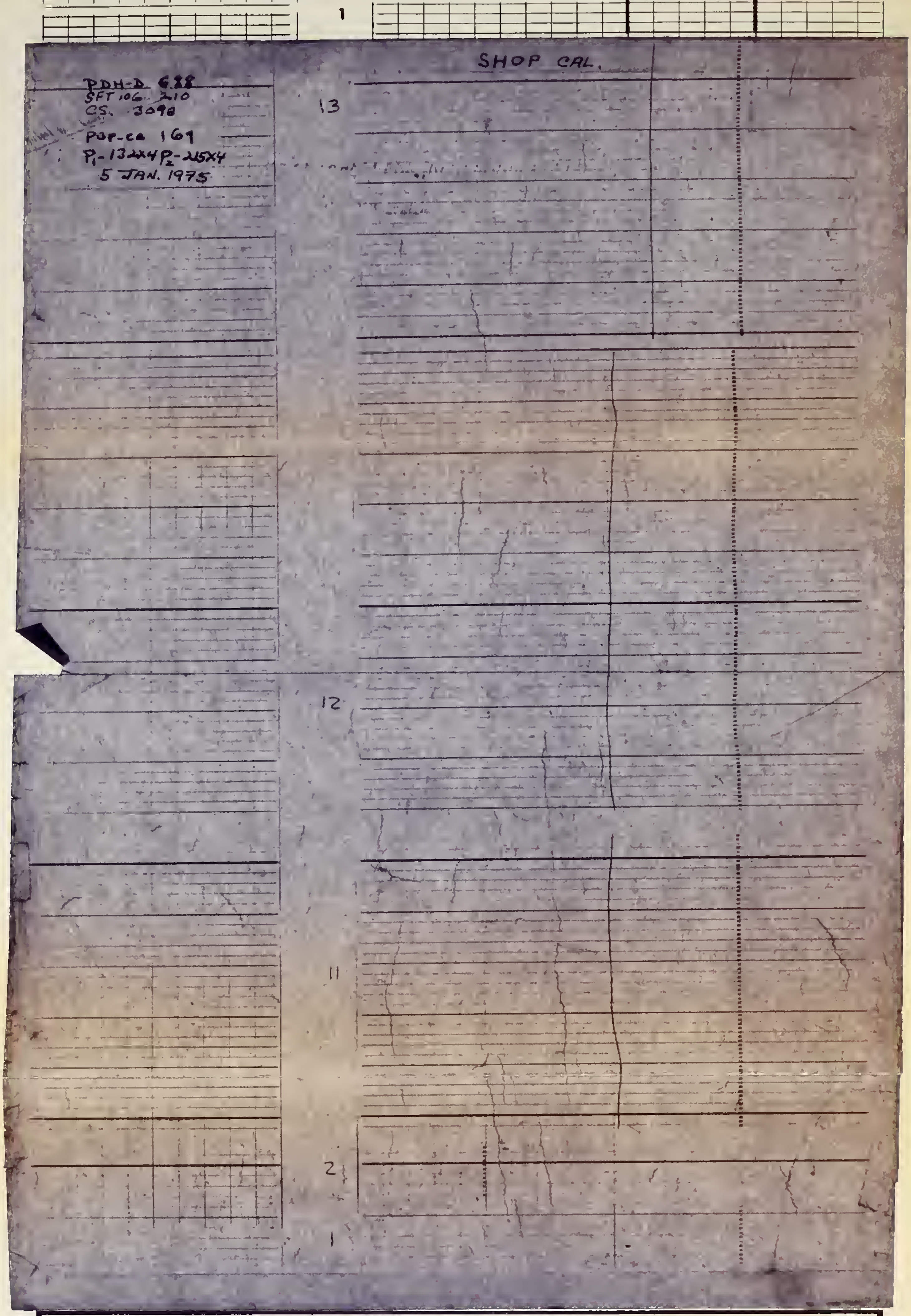
CALIBRATION AFTER SURVEY


CALIBRATION AFTER SURVEY
13
12
11
2
1
G. R. SURFACE CALIBRATION
6


5
4
3
2
1
CALIBRATION BEFORE SURVEY
13
12
11



PDH-D 6.88
SFT 106 2.10
CS. 3098
POP-ca. 169
P_1-132X4 P_2-215X4
5 JAN. 1975



FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST

FDC LIQUID

	POS	ρ	$\Delta\rho$
3.	# 1	2.92	.00
4.	# 2	2.78	+.14
5.	# 3	2.42	−.10
6.	# 4	2.35	.00
7.	# 5	2.08	.01

8. MECHANICAL ZERO CALIPER
9. 8" RING
10. 12" RING
11. TOOL CALIBRATE # 1 SET $\rho = 2.50$
12. TOOL CALIBRATE # 2 SET $\Delta\rho = .00$
13. LOG POSITION $\rho = 2.59$, $\Delta\rho = .015$

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATE - SOURCE IN PLACE

↑

CALIBRATION RECORD

COMPANY ATLANTIC RICHFIELD
WELL SORGHUM GULCH 1-A
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 937
SCHL. TD 938
DRLR TD 938
Elev:
KB ---
DF ---
GL ---

COREHOLE SG-8

THIS ENVELOPE CONTAINS THE FOLLOWING GEOPHYSICAL LOGS:

1. Schlumberger Sonic
2. Schlumberger Borehole Compensated Sonic
3. Schlumberger Laterolog

II B-2 208

Schlumberger

AMPLITUDE - VARIABLE DENSITY

SONIC LOG - GAMMA RAY

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #8
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #8

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

Location: API Serial No.
2600' FWL & 2301' FSL
Sec. 9 Twp. 35S Rge. 96W

Other Services:
HRT
FDC-GR
BHC-GR
LL-7

Permanent Datum: GL ; Elev.: 6538
Log Measured From GL , 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. 6542
G.L. 6538

Date	11-28-74			
Run No.	ONE			
Depth—Driller	2608			
Depth—Logger	2606			
Btm. Log Interval	2596			
Top Log Interval	170			
Casing—Driller	8 5/8@ 176	@	@	@
Casing—Logger	170			
Bit Size	6-1/4			
Type Fluid in Hole	WATER			
Fluid Level	± 100			
Dens. | Visc.				
pH | Fluid Loss	ml	ml	ml	ml
Source of Sample	MUD PIT			
R_m @ Meas. Temp.	3.79@68 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	CLEAR@ °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	WATER@ °F	@ °F	@ °F	@ °F
Source: R_{mf} | R_{mc}	AIR DRILLED			
R_m @ BHT	2.05@126 °F	@ °F	@ °F	@ °F
Time Since Circ.	1700 11-27			
Max. Rec. Temp.	126 °F	°F	°F	°F
Equip. | Location	7674 | VRNL			
Recorded By	DALTON-ETTER			
Witnessed By	BURNS-TAIT			

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.		
Depth - Driller		
Type Fluid in Hole		
Dens. | Visc.		
ph | Fluid Loss	ml	ml
Source of Sample		
R_m @ Meas. Temp.	@ °F	@ °F
R_{mf} @ Meas. Temp.	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F
Source: R_{mf} | R_{mc}		
R_m @ BHT	@ °F	@ °F
R_{mf} @ BHT	@ °F	@ °F
R_{mc} @ BHT	@ °F	@ °F

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

EQUIPMENT DATA

Run No.	ONE		
Sonic Panel No.	173 (493 AMC CARD OUT)		
Sonic Cart No.	141		
Sonic Sonde No.	161		
Mem. Panel No.	173		
G.R. Cart. No.	98		
G.R. Panel No.	355		
Caliper No	VCD-D		
TTR No.	-		
Cent. Device	VCD-FINS		
Stand off - Inches	1-1/2		
Time Const. - Sec.	2		
Speed - F.P.M.	30		

REMARKS

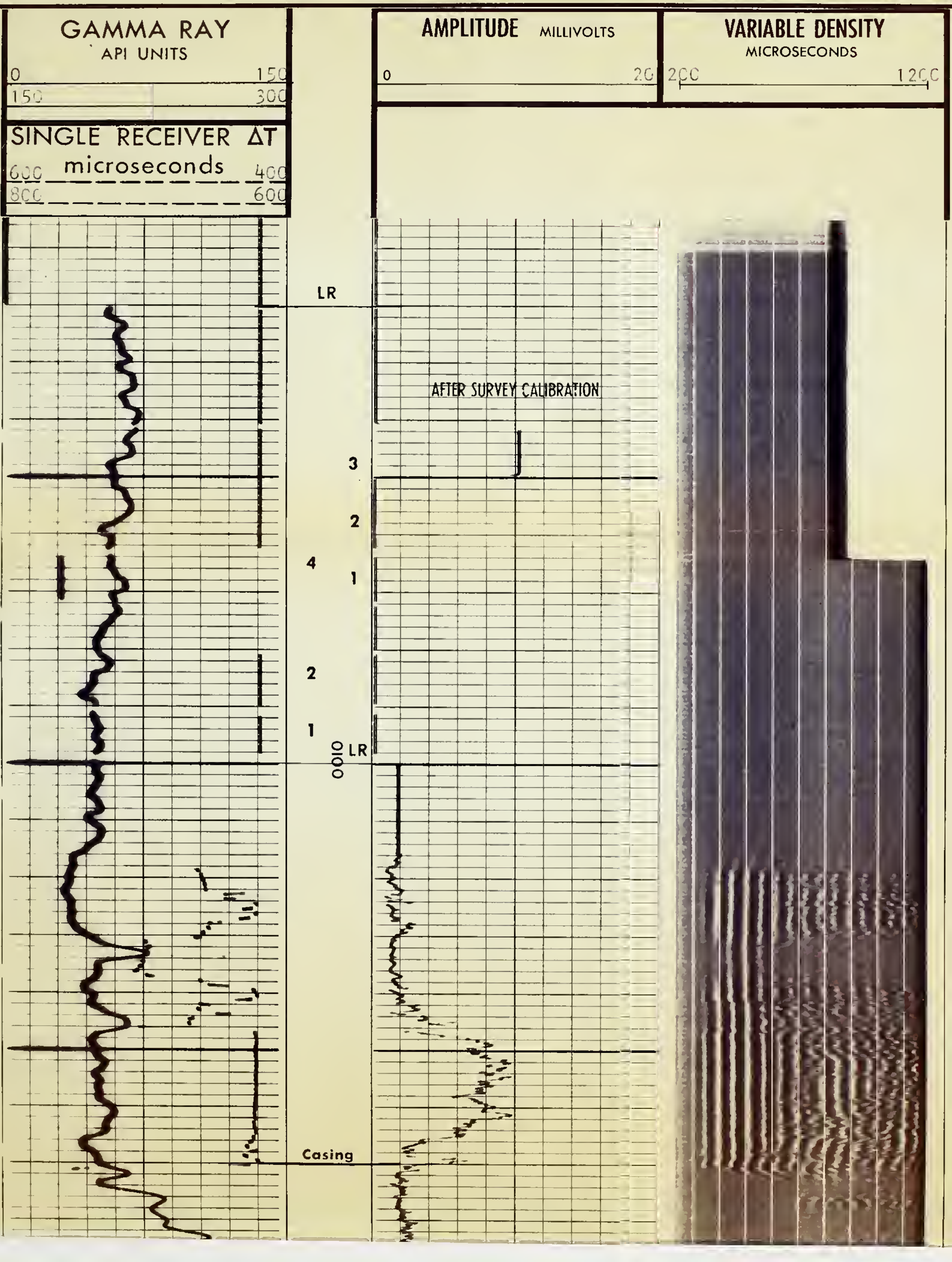
Service Order No. - 28182
SHORT REPEATS NOT TIED IN TO LOG.
SCOPE: .1μSEC. HORIZ.,50 MV VERT.,I[illegible]
TRIGGER
AMP-VDL RUN ON: NORMAL
MODE 1 UT-FR = 5' SPACING*
E[illegible] CART = 1/20
Tv = 1 AMP SCALE = 20MV
WELL MAKING WATER
GR CAL DURING BHC
OIL & TAR IN WATER & ON TOOLS
*CUSTOMER REQUEST
1200'-900' ZONE DUE TO ERROR IN KNOB
SELECTION. SEE REPEAT FOR ZONE.
AMPLITUDE VERY LOW OVER MUCH OF WELL
AND LOOKED GENERALLY LIKE:

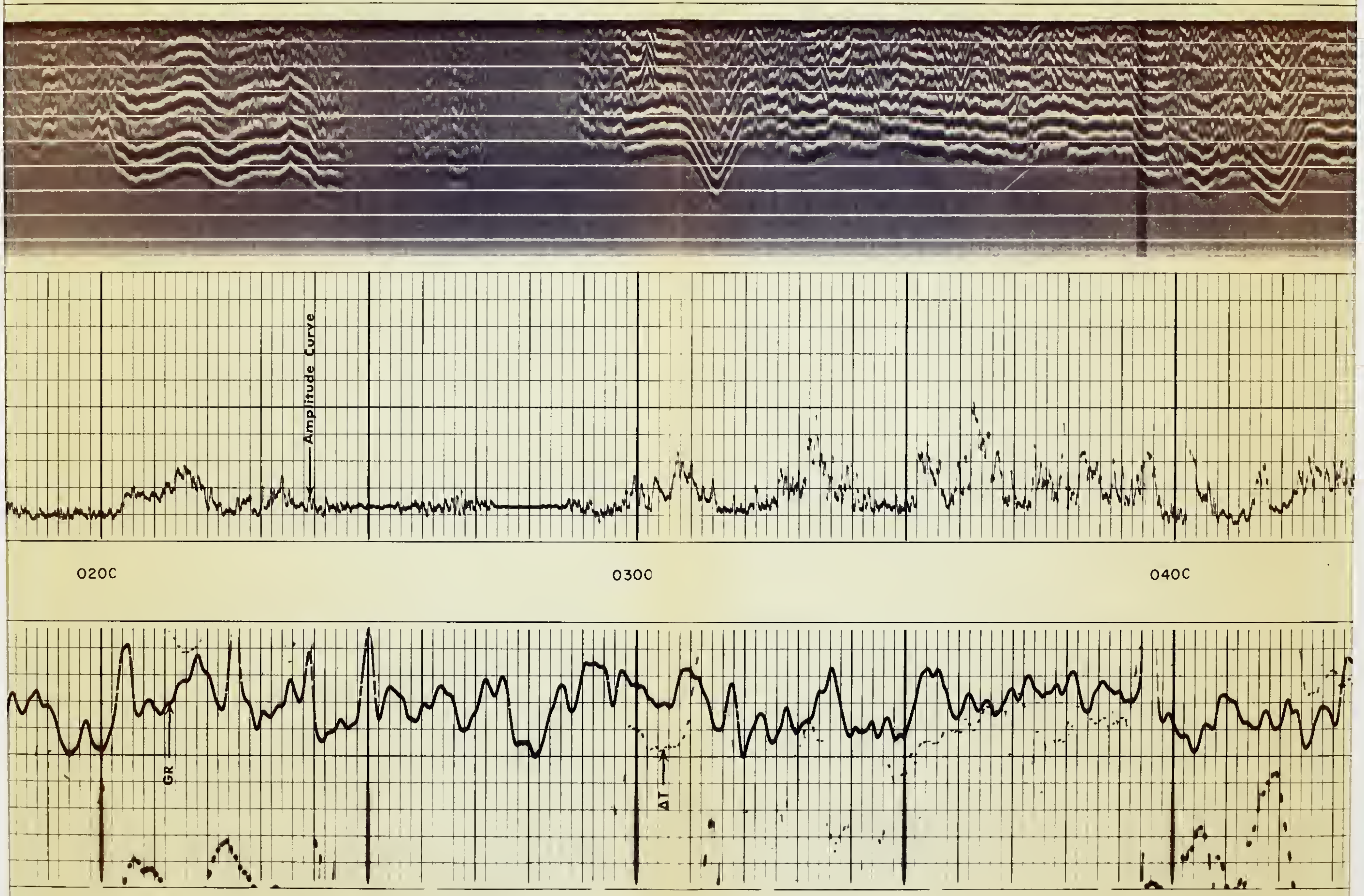
CALIBRATION DATA

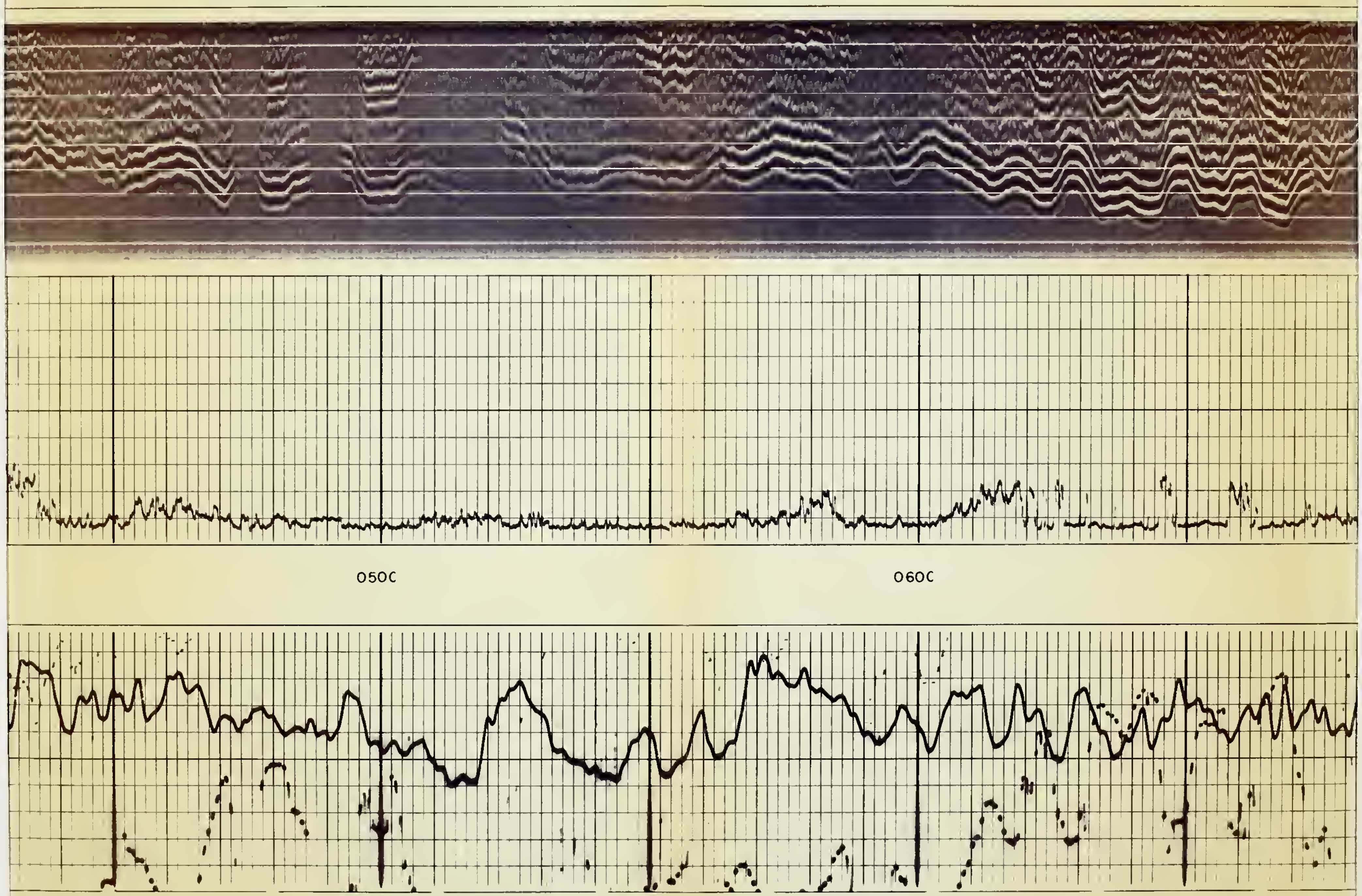
CALIBRATION DATA

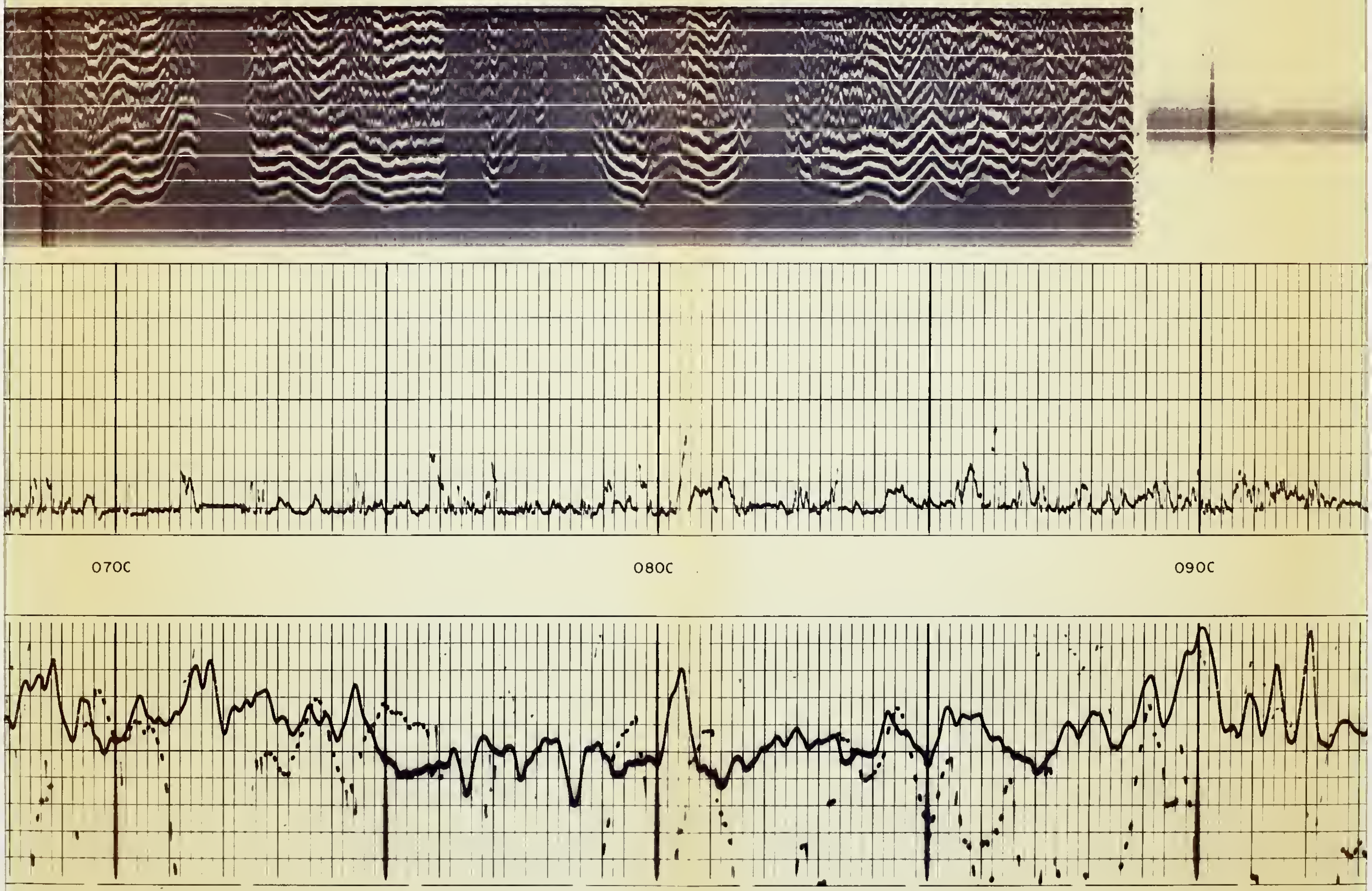
CALIBRATION:	BACKGND. CPS.	SOURCE CPS.	GALV. INCR. DIVISION	SENS. TAP (FOR CAL.)	SENS. TAP (RECORD)	TIME CONST.	
GAMMA RAY:	SEE BHC LOG GR RUN THIS LOG & THAT ONE						

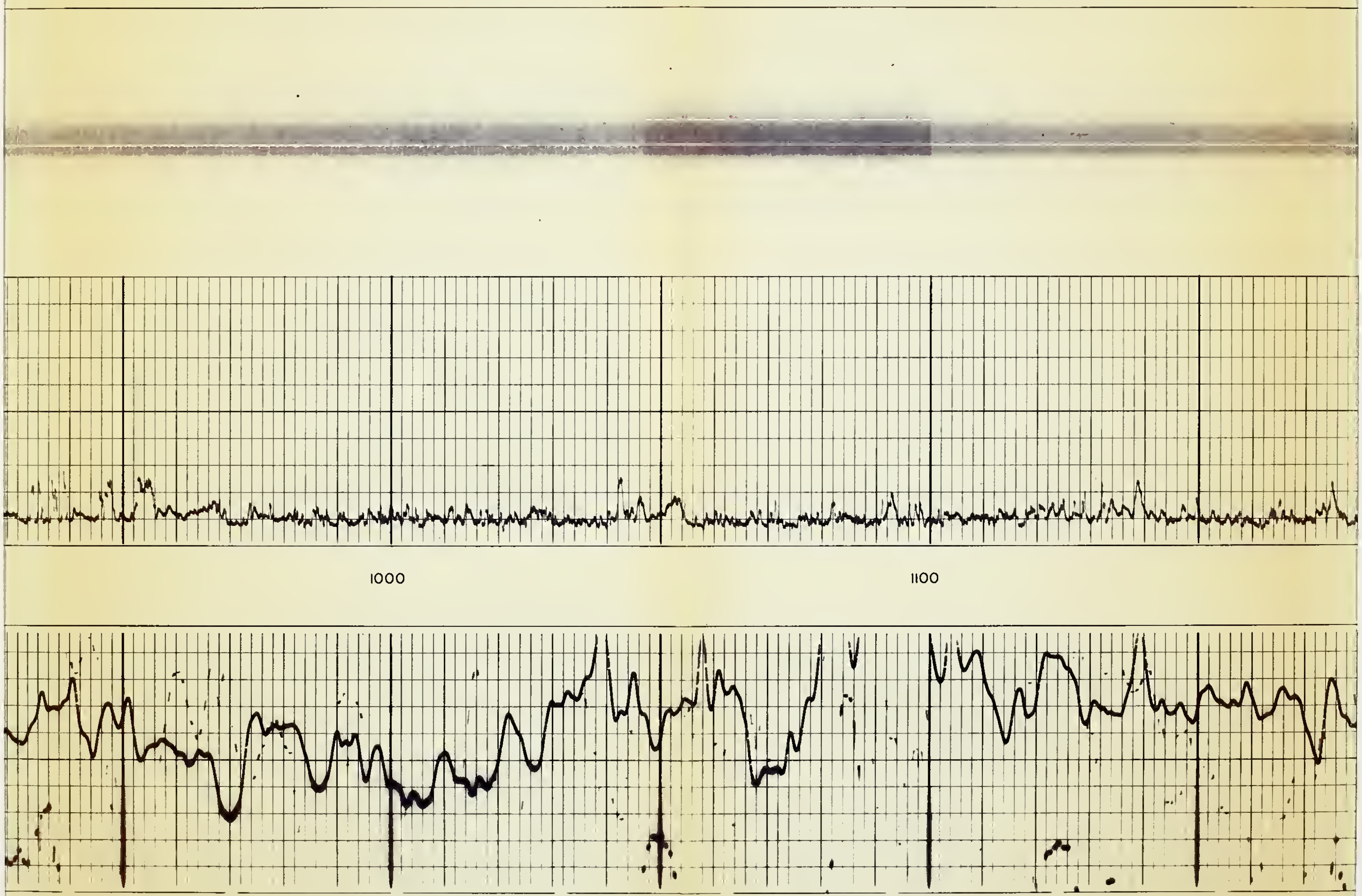
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

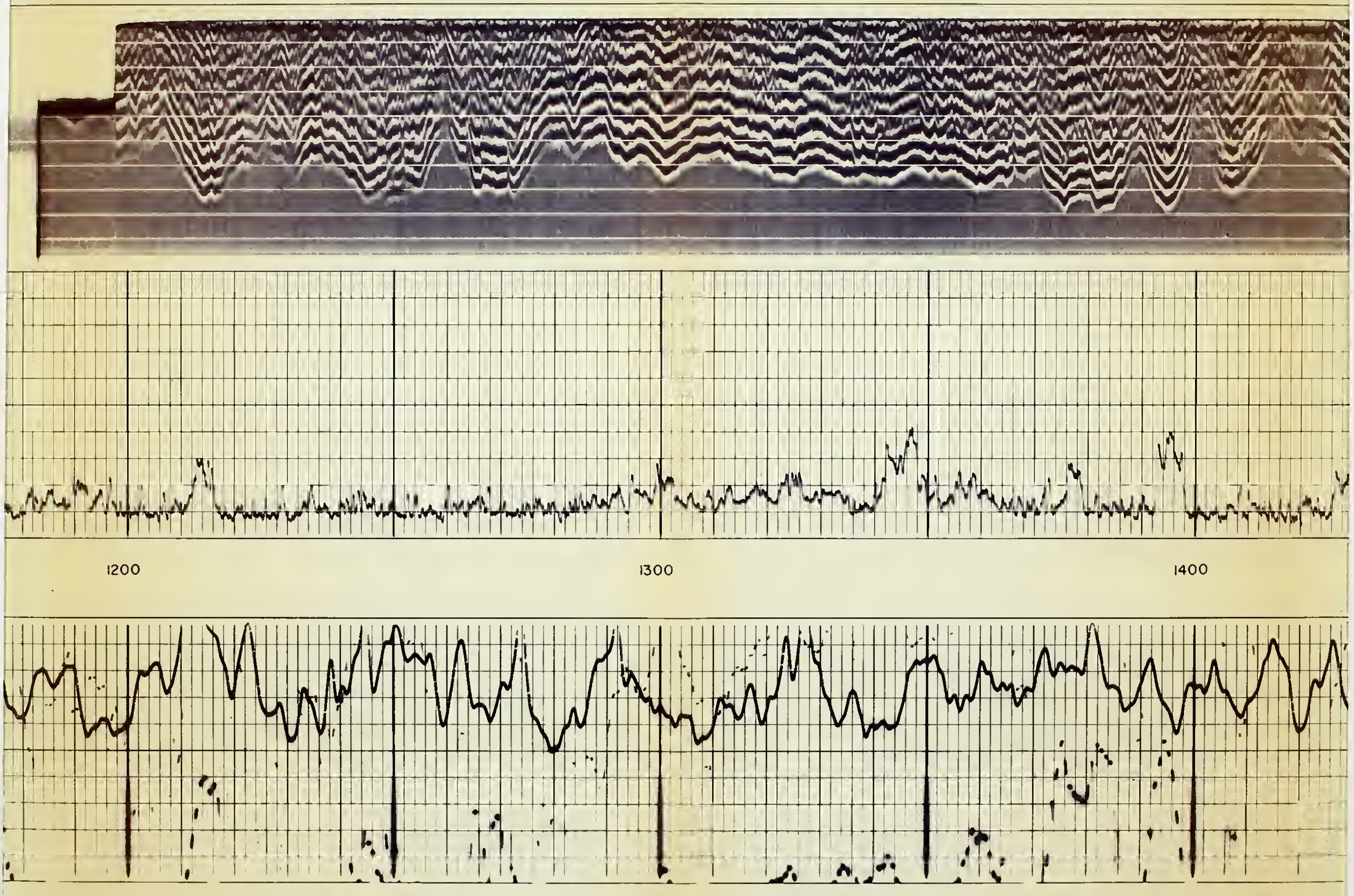


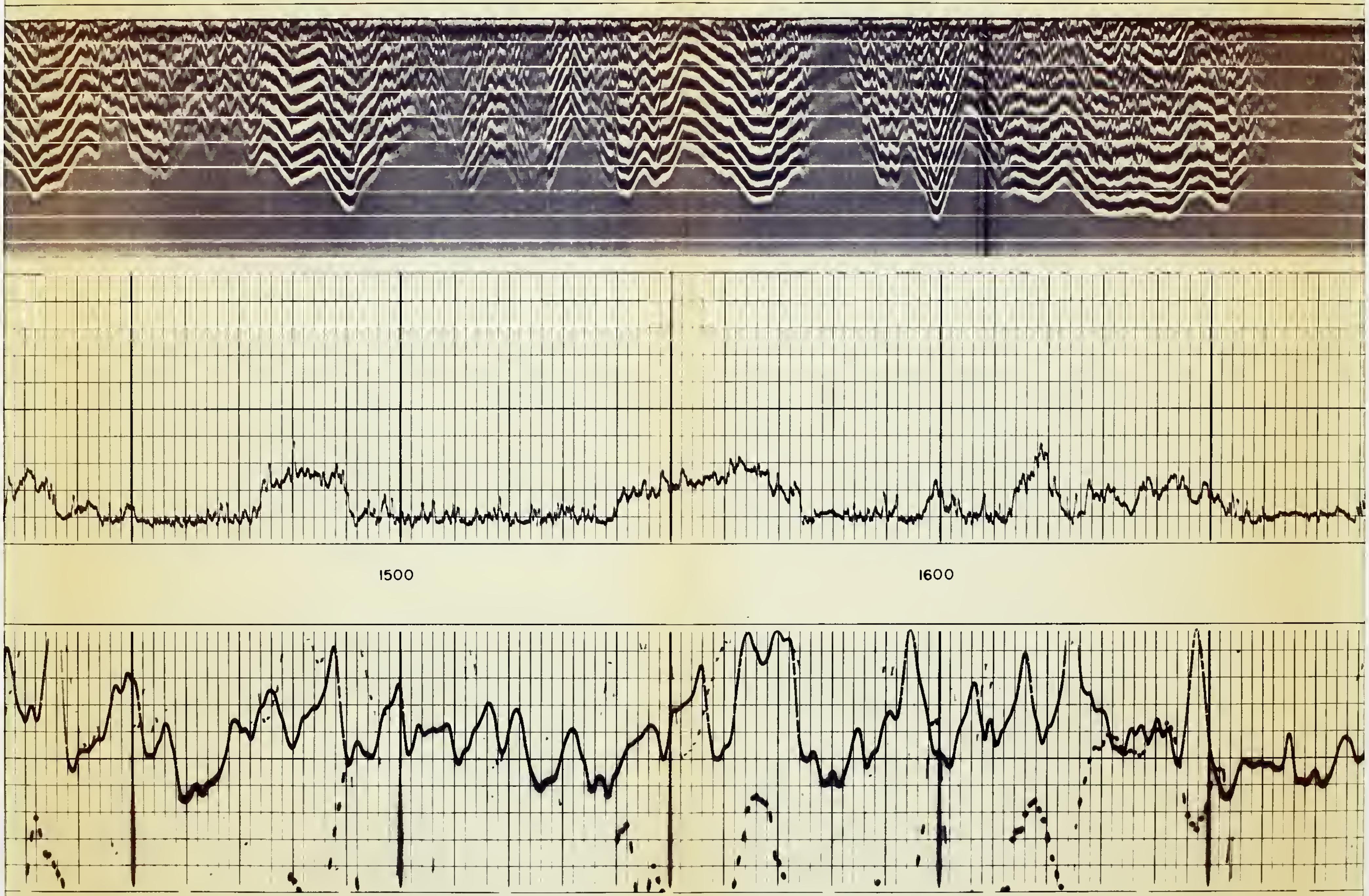

Amplitude Curve
020C
0300
040C
GR
ΔT

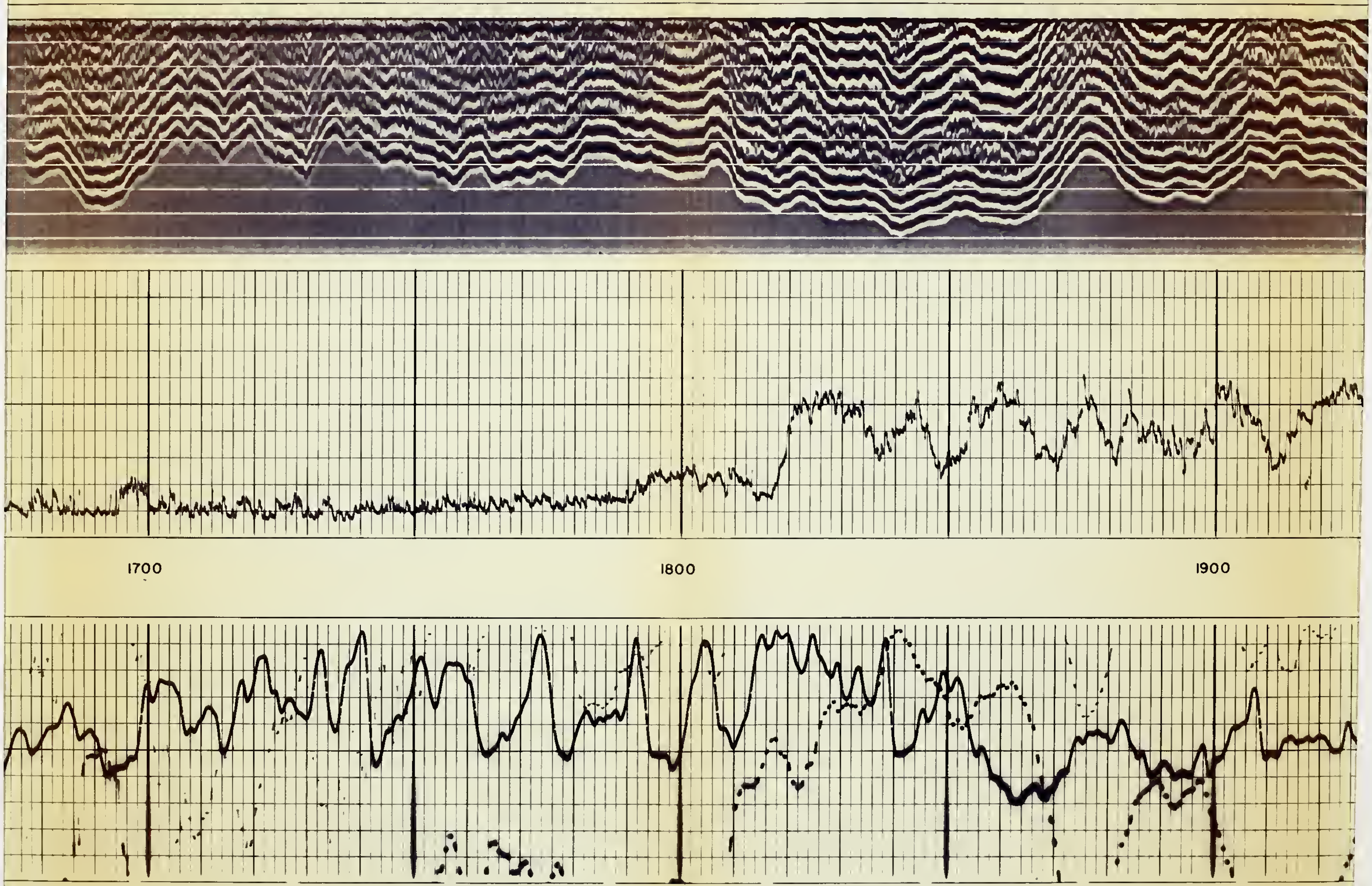

050C
060C

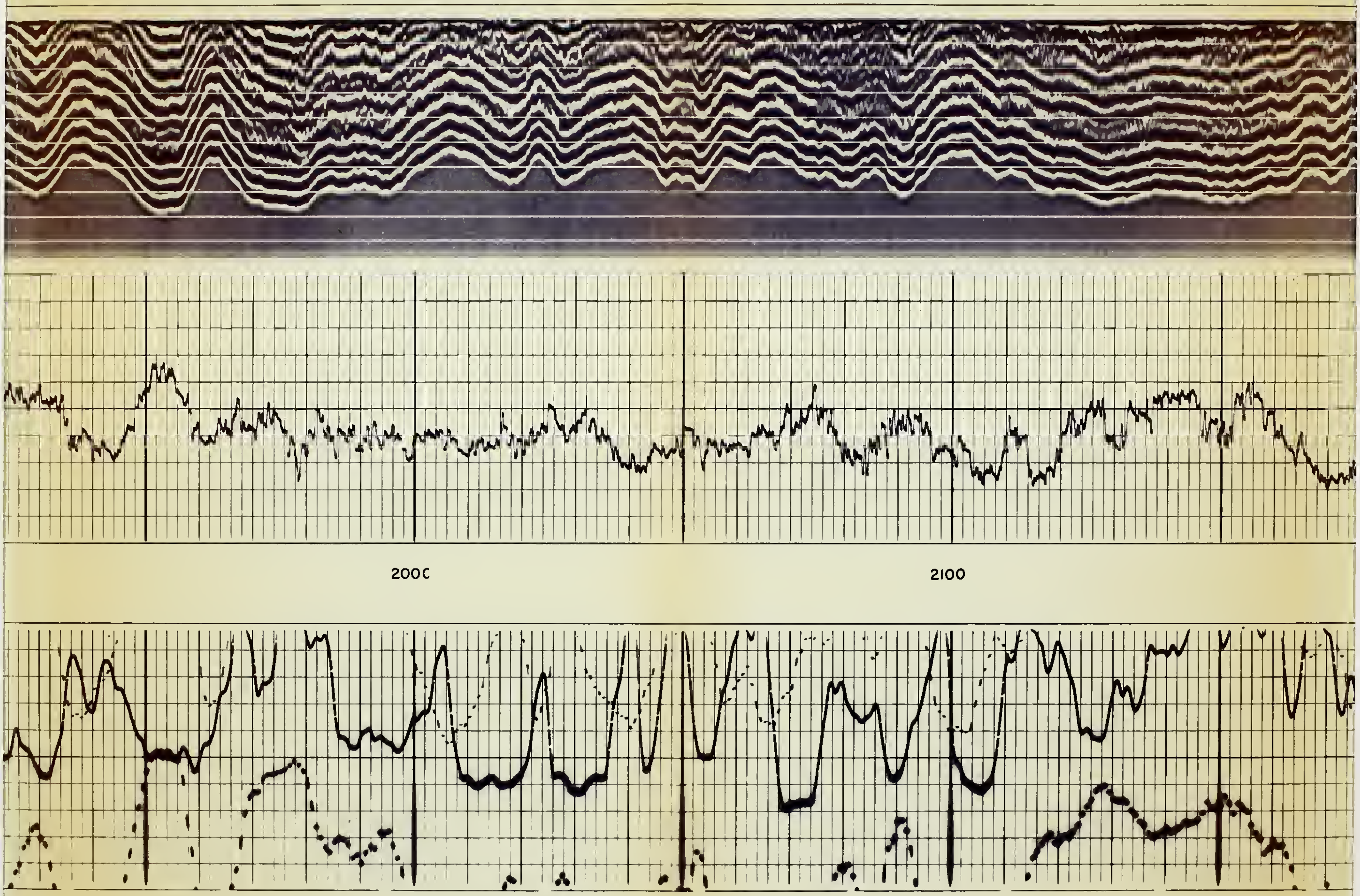

0700
0800
0900

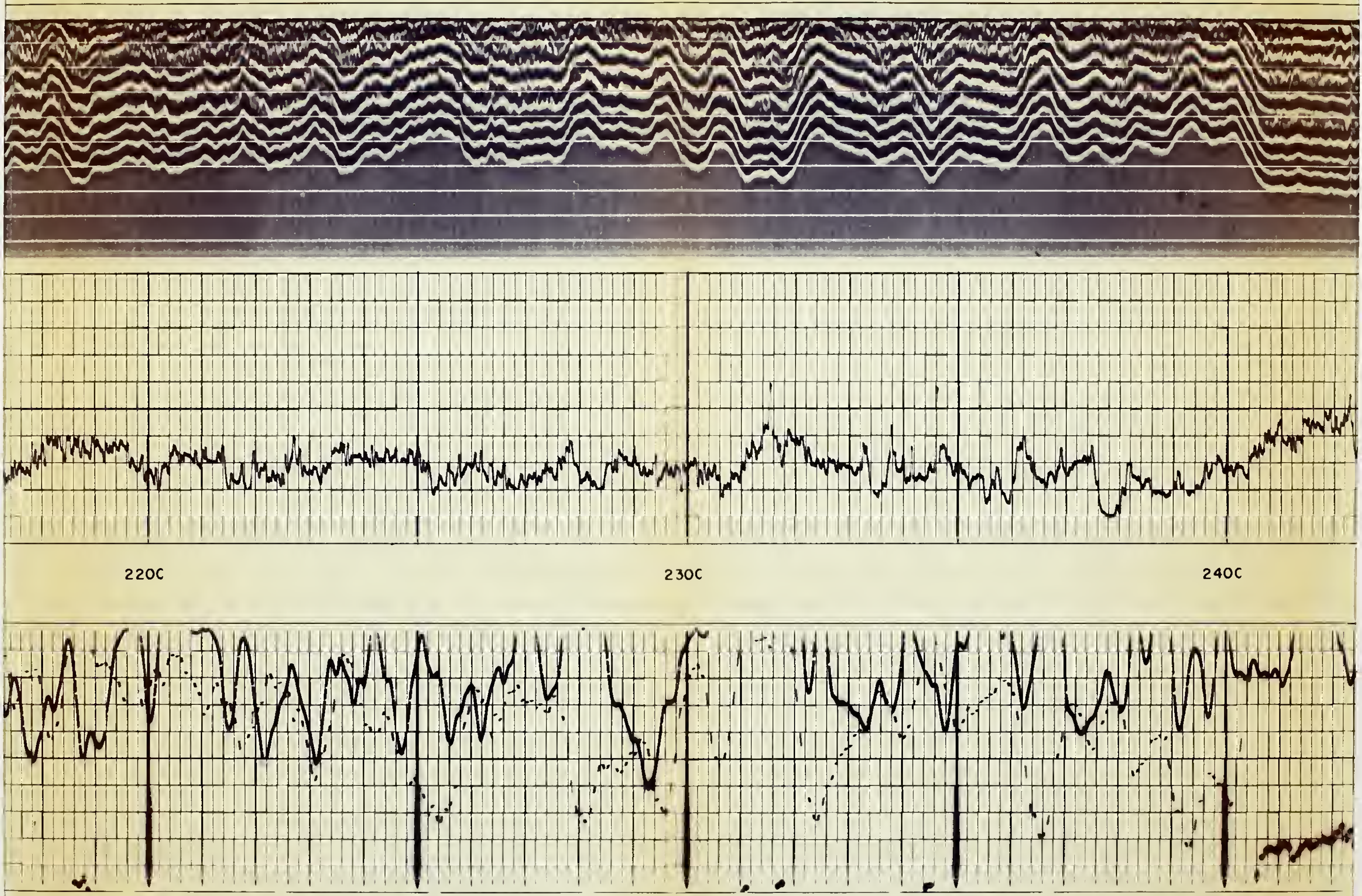

1000
1100

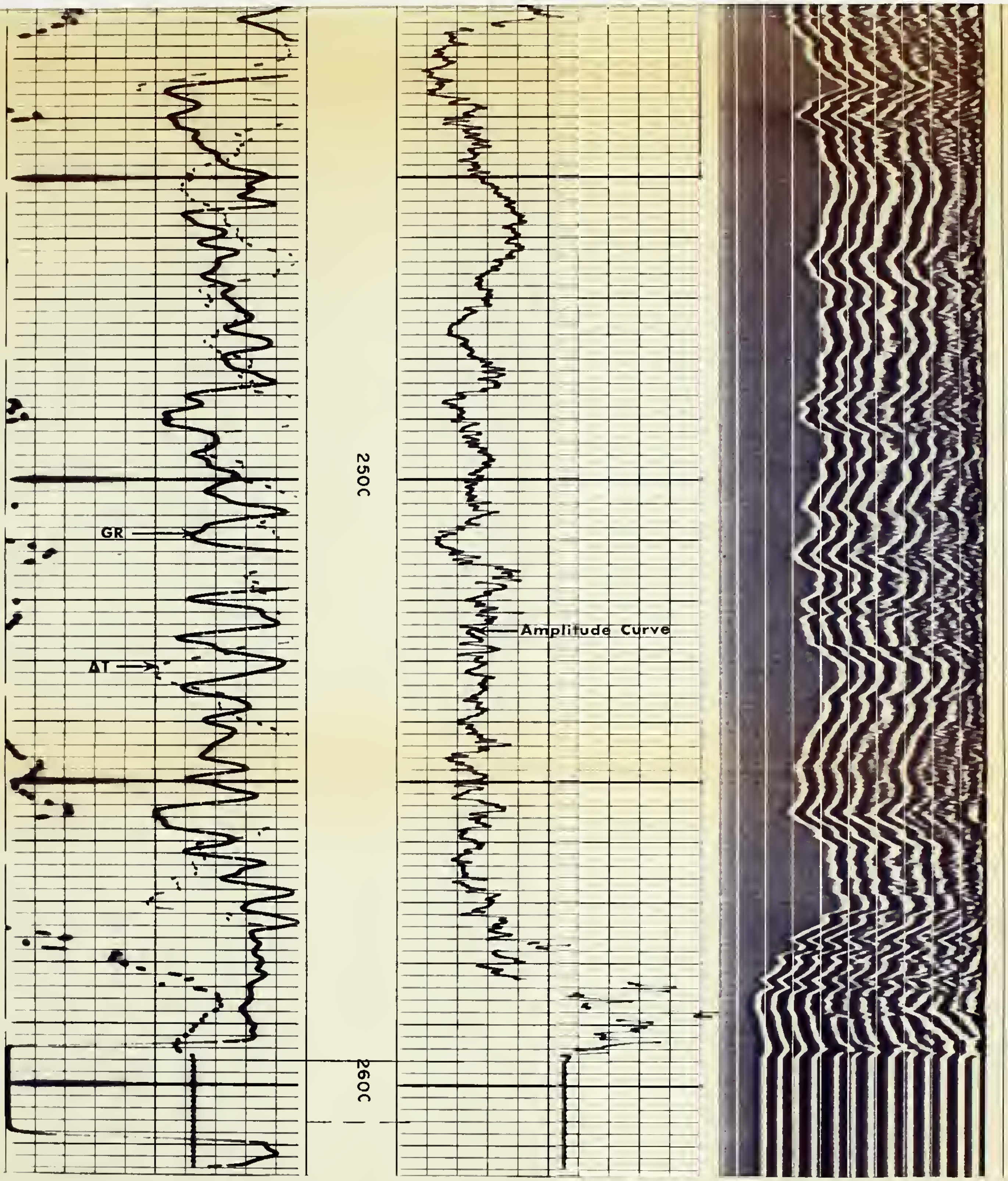

1200
1300
1400

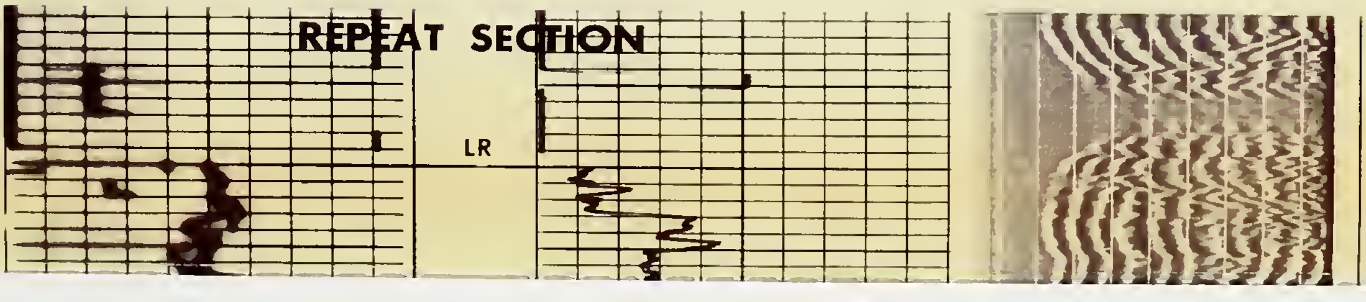

1500
1600

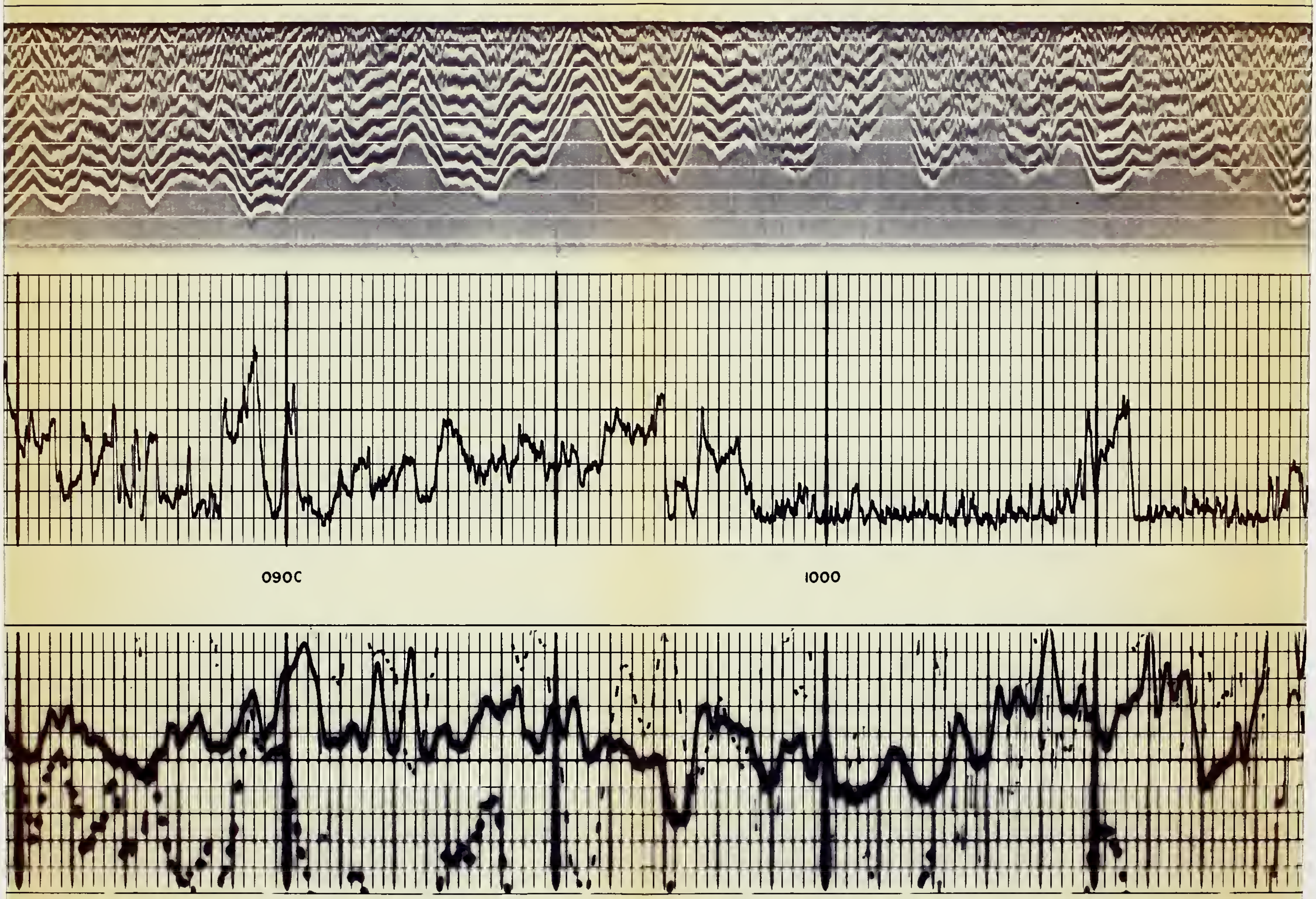

1700
1800
1900

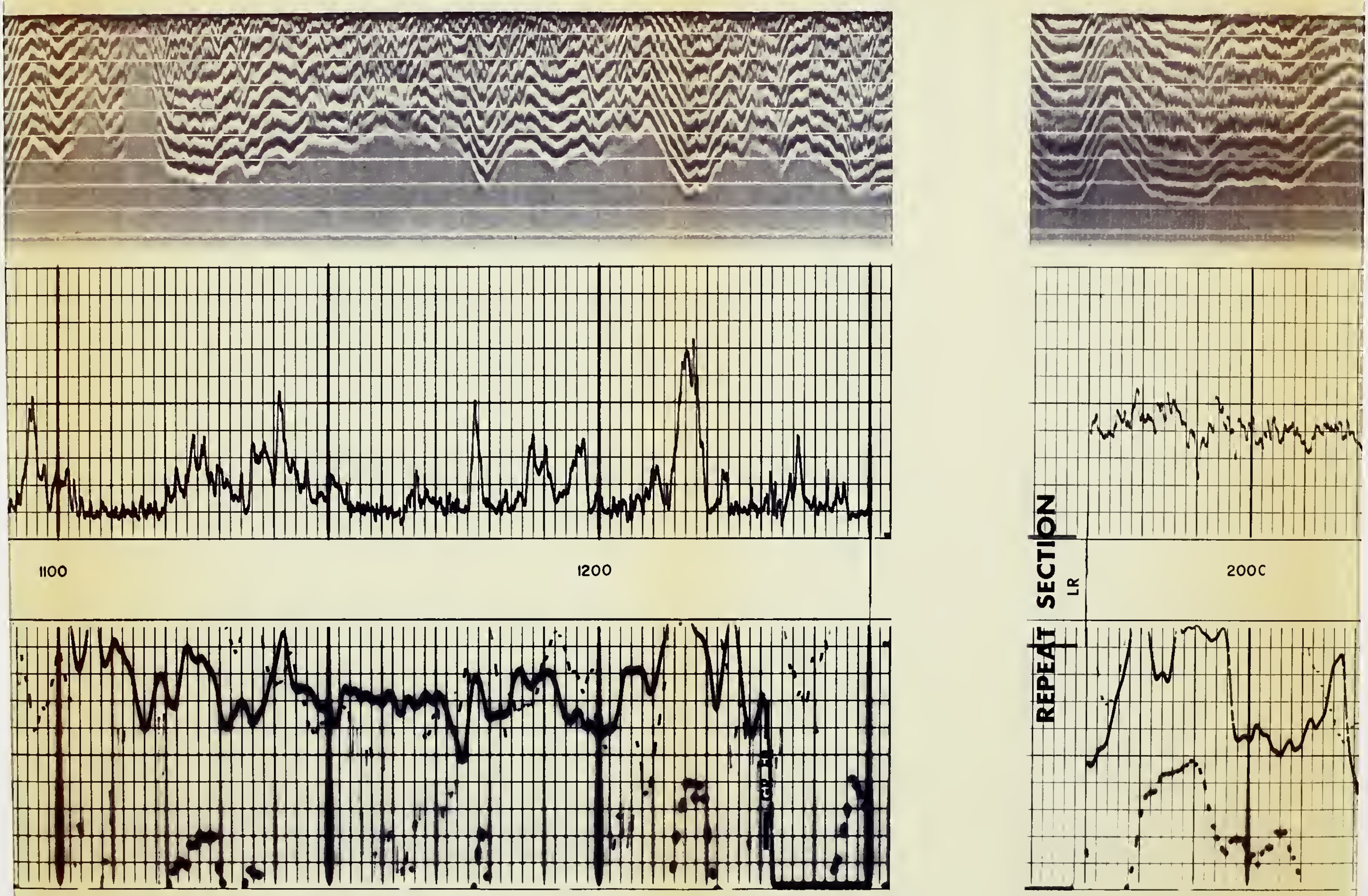

2000
2100

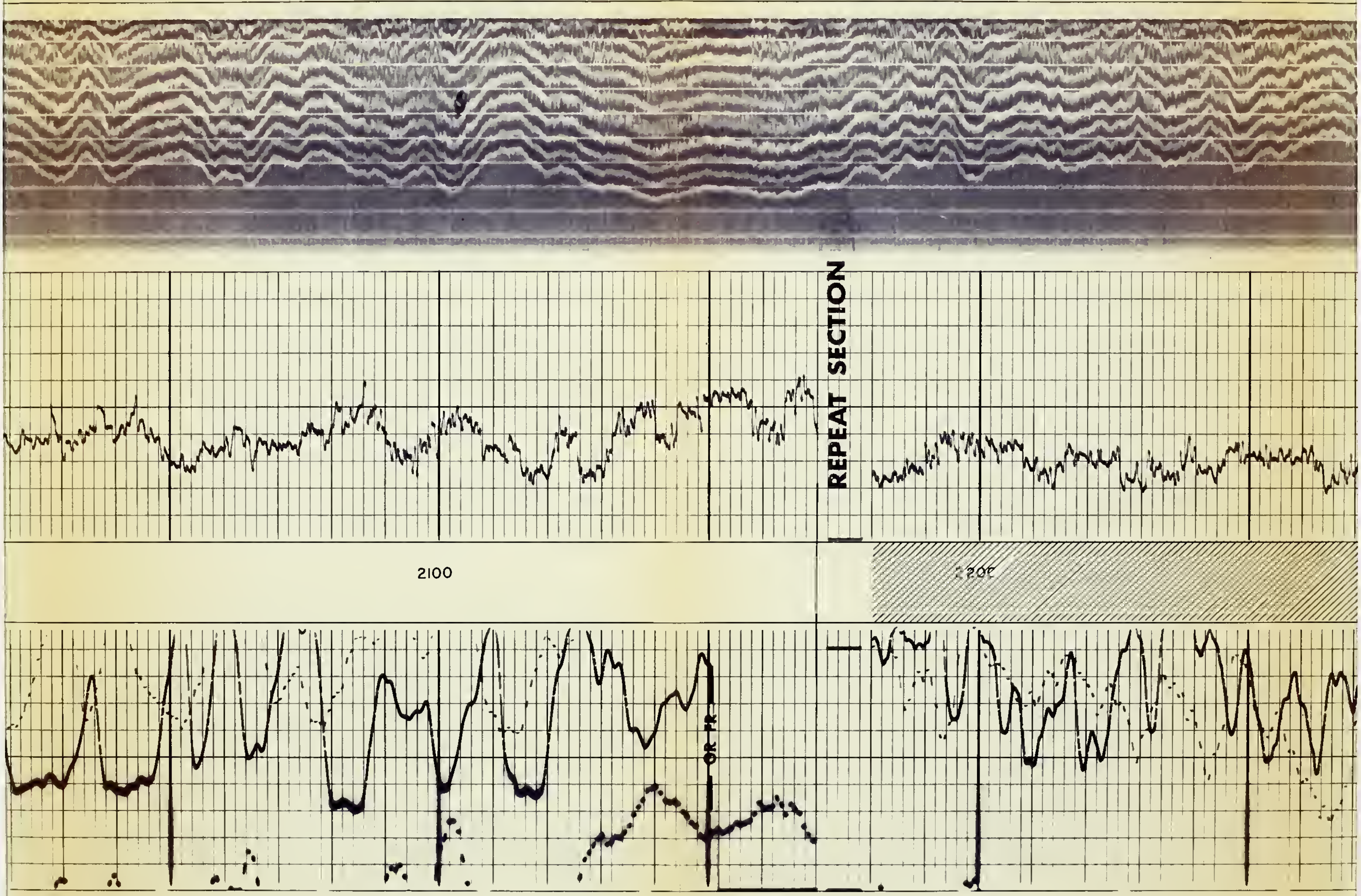

2200
2300
2400

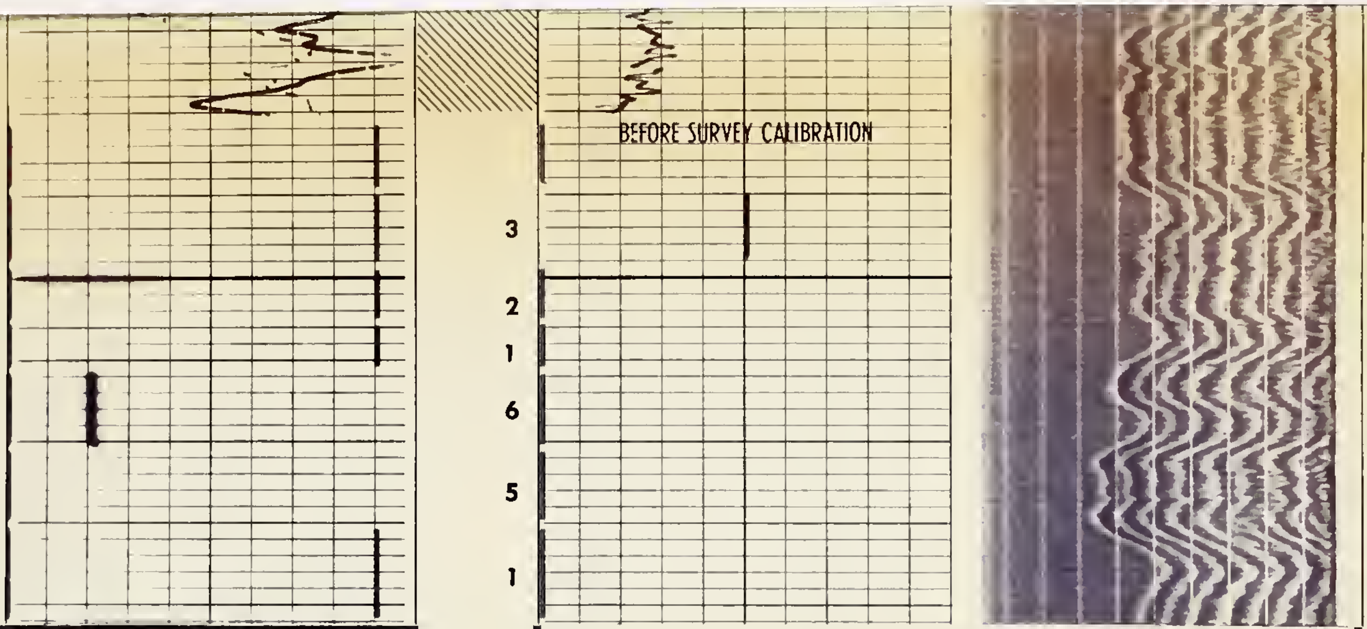

2500
2600
GR
ΔT
Amplitude Curve


REPEAT SECTION
LR


0900
1000


1100
1200
REPEAT SECTION
LR
2000


REPEAT SECTION
2100
2200
OR FR



GAMMA RAY
API UNITS
0 150
150 300

SINGLE RECEIVER ΔT
microseconds
600 800
300 600

AMPLITUDE MILLIVOLTS
0 20

VARIABLE DENSITY
MICROSECONDS
200 1200

BOREHOLE COMPENSATED SONIC CALIBRATION CODING

1. MECHANICAL ZERO
2. 40 μ SEC/FT
3. 60 μ SEC/FT
4. 80 μ SEC/FT
5. 100 μ SEC/FT
6. 140 μ SEC/FT

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATION

COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #8
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2608
SCHL. TD 2606
DRLR TD 2596
Elev:
KB ----
DF 6542
GL 6538

SWS-1129-D

Schlumberger

BOREHOLE COMPENSATED SONIC LOG

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #8
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #8

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION: API Serial No.
2600' FWL & 2301' FSL
Sec. 9 Twp. 35S Rge. 96W

Other Services:
LL-7
HRT
FDC
AMP-VDL

Permanent Datum: GL ; Elev.: 6538
Log Measured From GL , Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. 6542
G.L. 6538

Date	11-28-74			
Run No.	ONE			
Depth—Driller	2608			
Depth—Logger	2610			
Btm. Log Interval	2607			
Top Log Interval	167			
Casing—Driller	8 5/8@176	@	@	@
Casing—Logger	167			
Bit Size	6-1/4			
Type Fluid in Hole	WATER			
Dens. | Visc.				
pH | Fluid Loss	ml	ml	ml	ml
Source of Sample	MUDPIT			
R_m @ Meas. Temp.	3.79@68 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	CLEAR@ °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	WATER@ °F	@ °F	@ °F	@ °F
Source: R_{mf} | R_{mc}	AIR DRILLED			
R_m @ BHT	2.05@126 °F	@ °F	@ °F	@
TIME Circulation Stopped	1700 HOURS			
Max. Rec. Temp.	126 °F	°F	°F	°F
Equip. | Location	7674 | VRNL			
Recorded By	DALTON-ETTER			
Witnessed By	BURNS-TAIT			

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

Run No.	ONE			
Service Order No.	28182			
Fluid Level	VARING ± 100'			

EQUIPMENT DATA

Sonic Panel No.	493			
Sonic Cart No.	141			
Sonic Sonde No.	161			
Mem. Panel No.	173			
G.R. Cart. No.	98			
G.R. Panel No.	355			
Caliper No.	-			
TTR No.	-			
Centralizers: No.	1			
Type	VCD			
Standoffs: No.	2			
Type	1-1/2			
Time Const.-Sec.	2			
Speed - F.P.M.	30			
GAIN	1-1/5			

CALIBRATION DATA

GR	BKG. CPS	90		
	Source CPS	530		
	Tc Sec	CAL		

TIME MARKER DEVICE
REPAIRED DURING BHC
JOB. SEE REPEAT. -

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

LOGGING DATA

Porosity Selectors				Depth	
Δt_m	Δt_f	Cp	∅ Scale	From	To

REMARKS WELL PRODUCING FLUID. GLOBS
OF OIL IN WATER.
COULD NOT CALIBRATE CALIPER AS RIG
TOO SHORT FOR LENGTH OF TOOLS. MADE
UP LIKE DRILL PIPE. (3FT. CONELATION
ALL SPEEDS 30'/MIN. TO FDC)

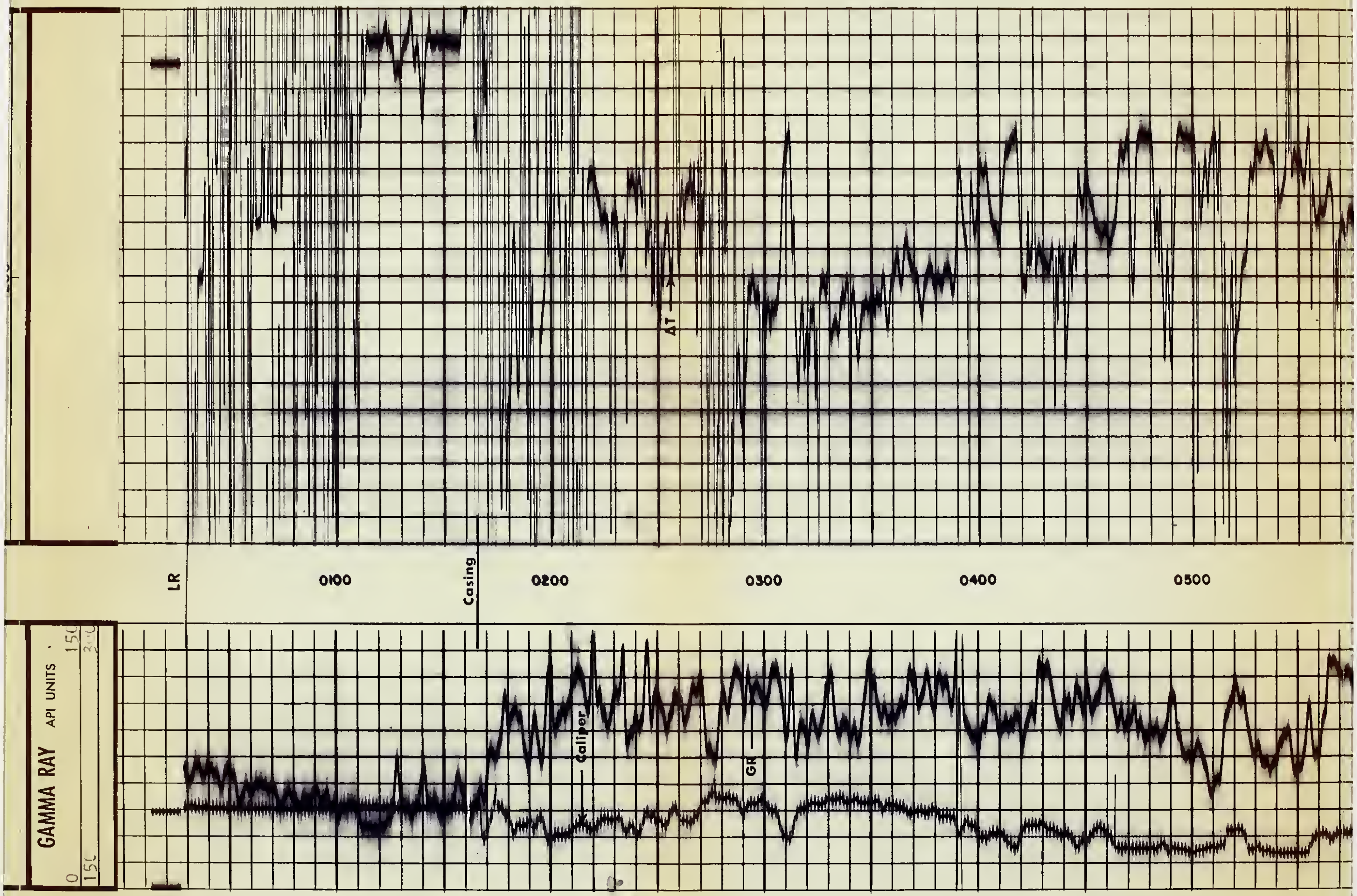
$$\text{Velocity (ft/sec)} = \frac{1{,}000{,}000}{\text{Interval Transit Time (microseconds per foot)}}$$

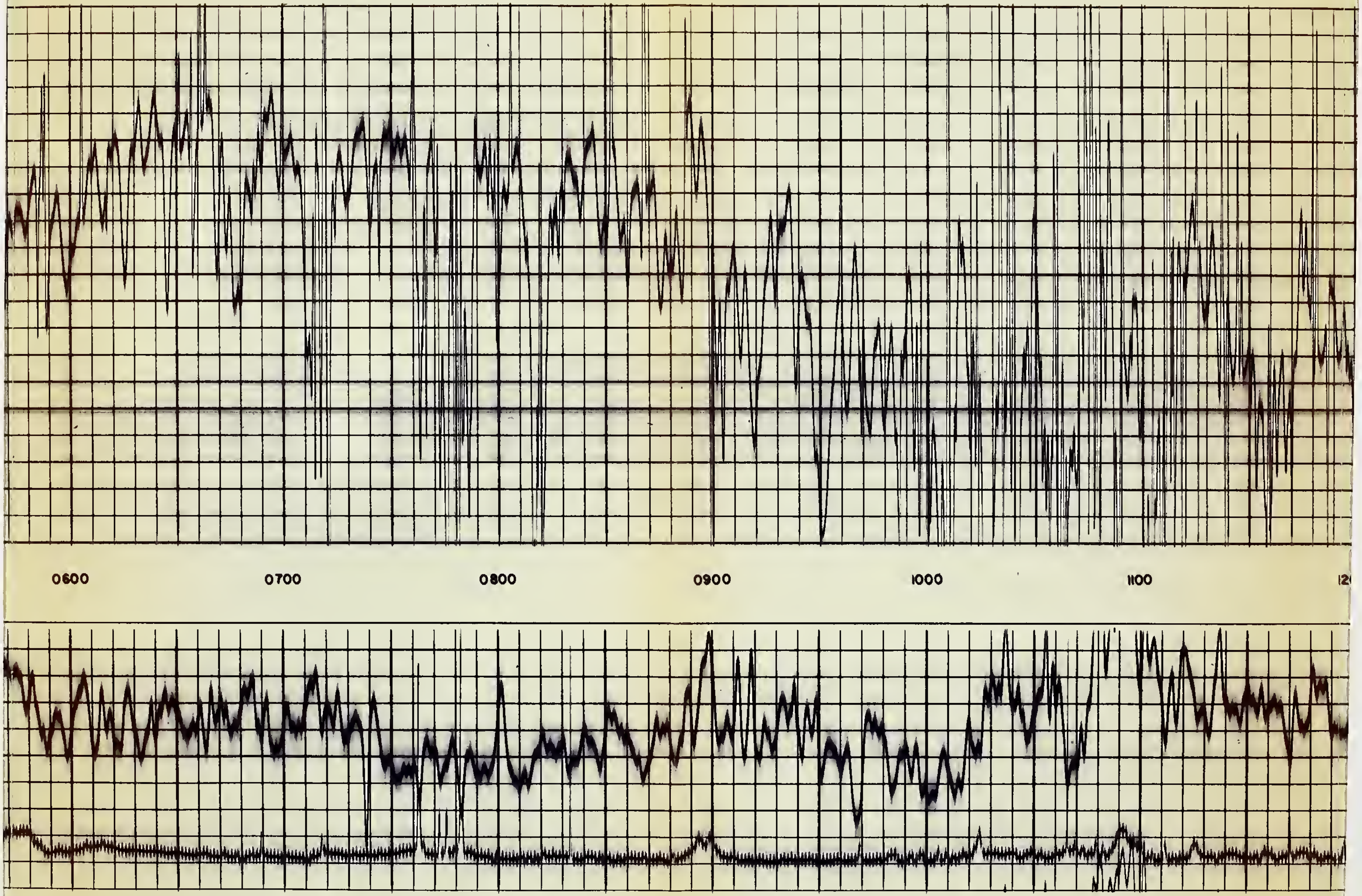
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

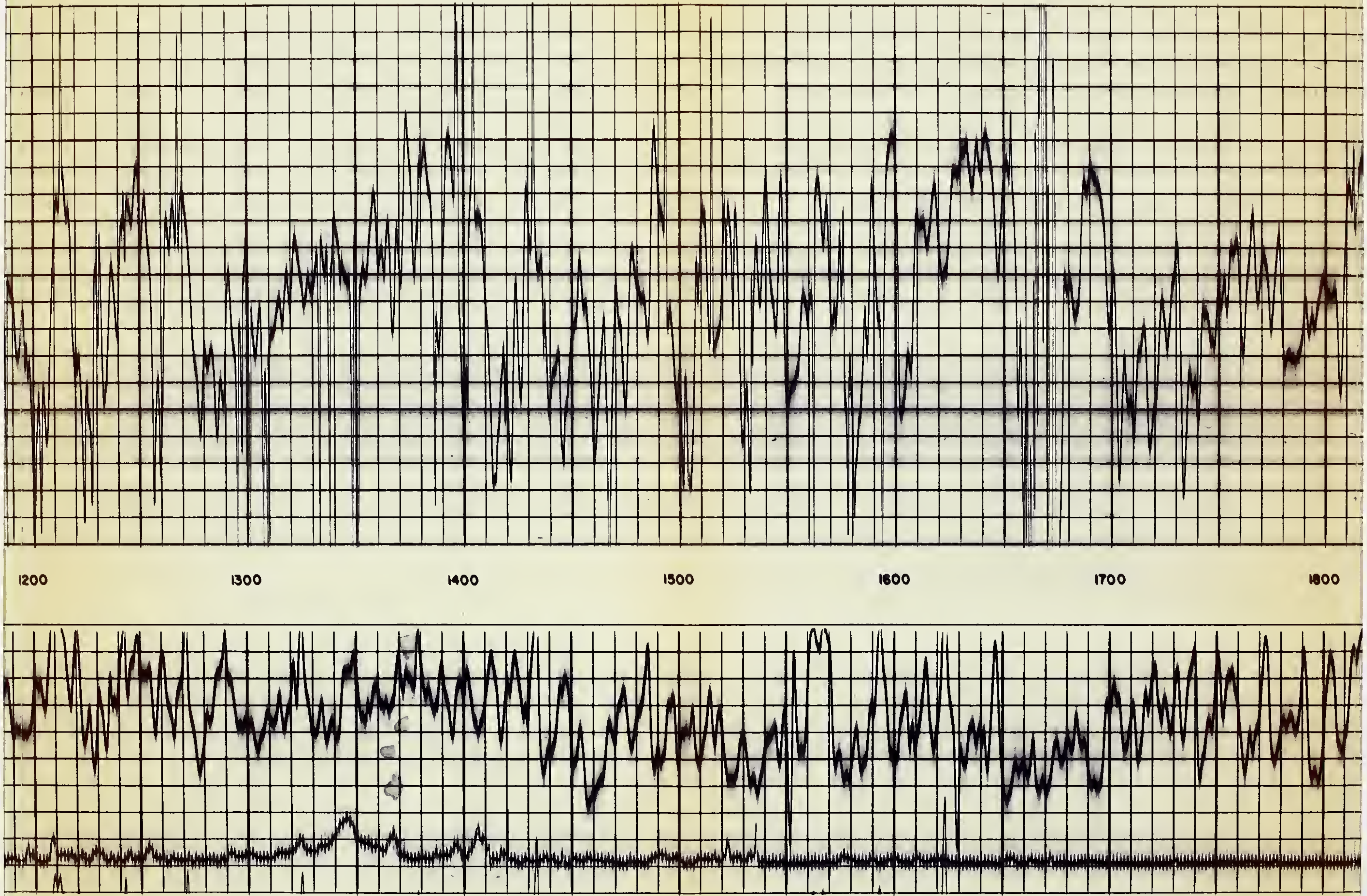
CALIPER DIAM. IN INCHES
5 CORRELATION ONLY 15

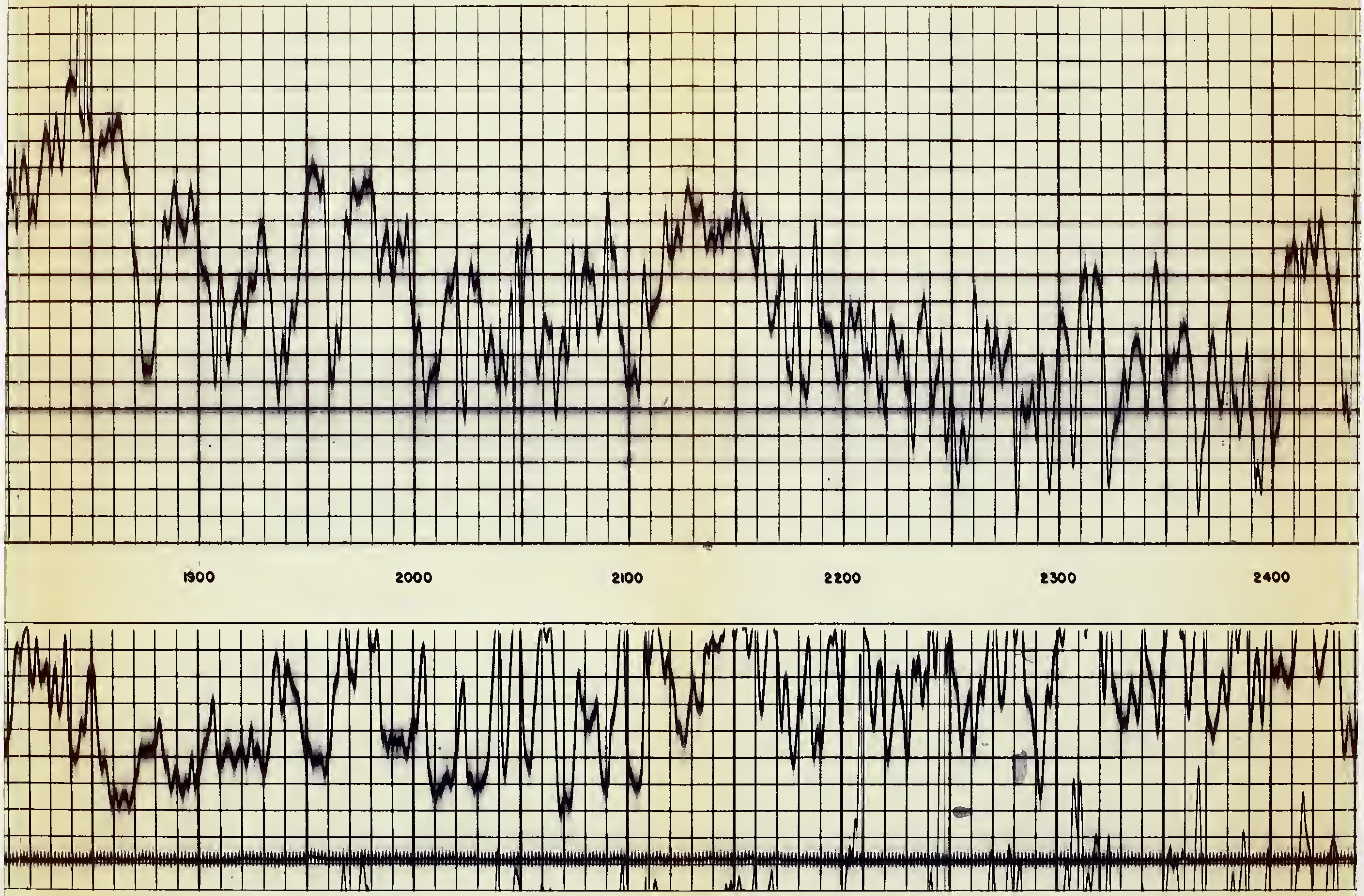
DEPTH

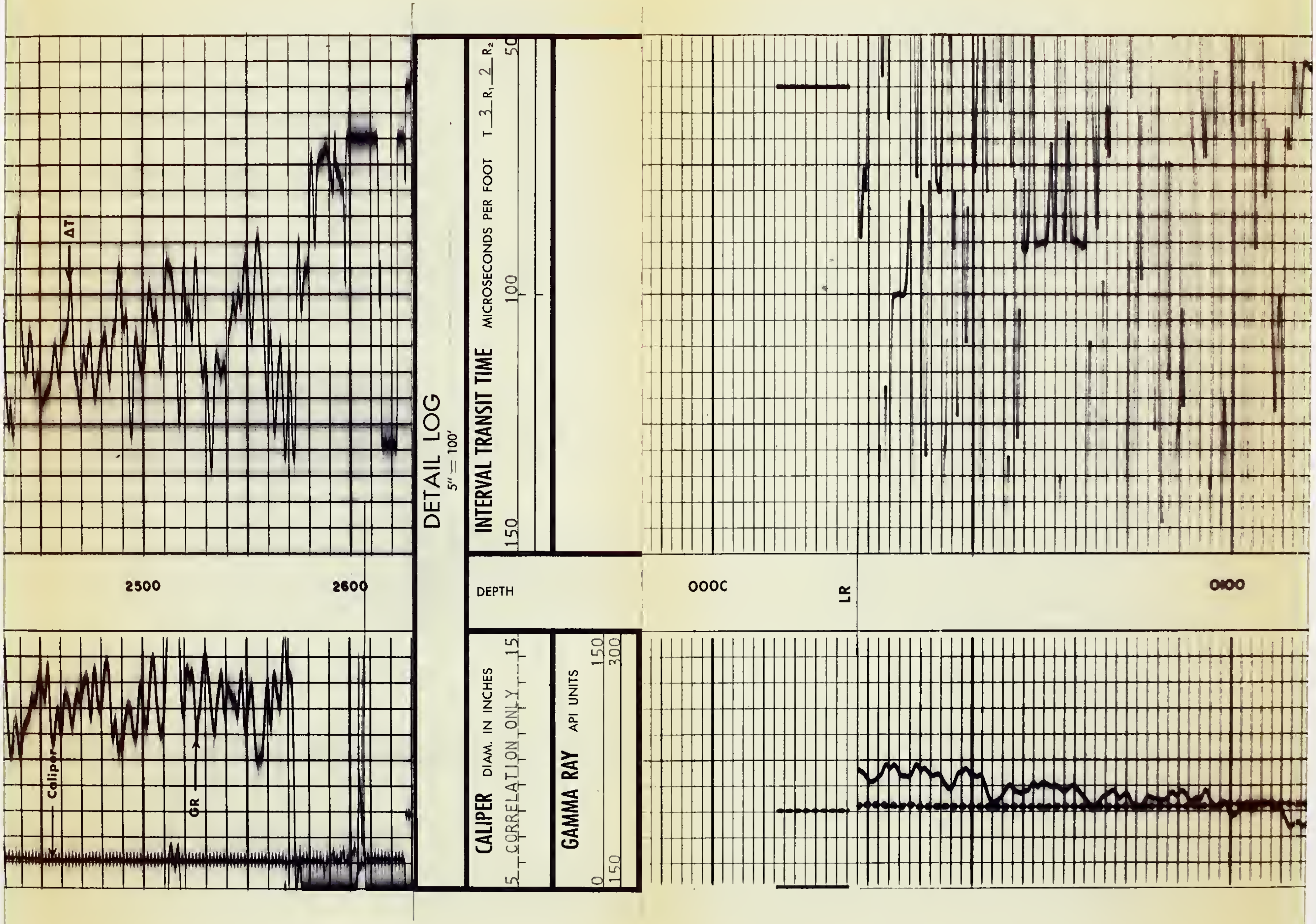
INTERVAL TRANSIT TIME MICROSECONDS PER FOOT T 3 R₁ 2 R₂
150 100 50
200 150

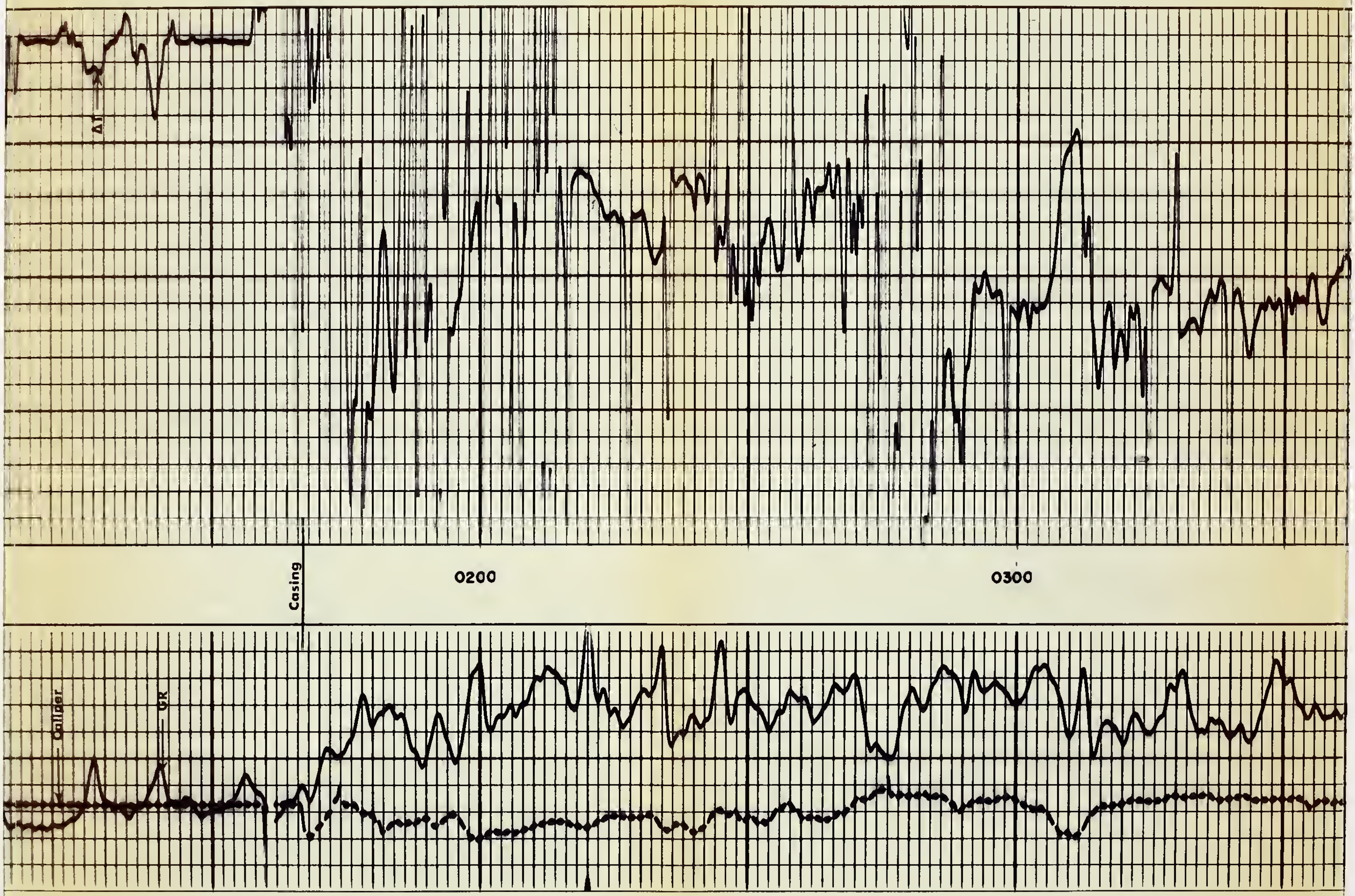

GAMMA RAY API UNITS
0
150
150
200
LR
0100
Casing
0200
0300
0400
0500
ΔT
Caliper
GR

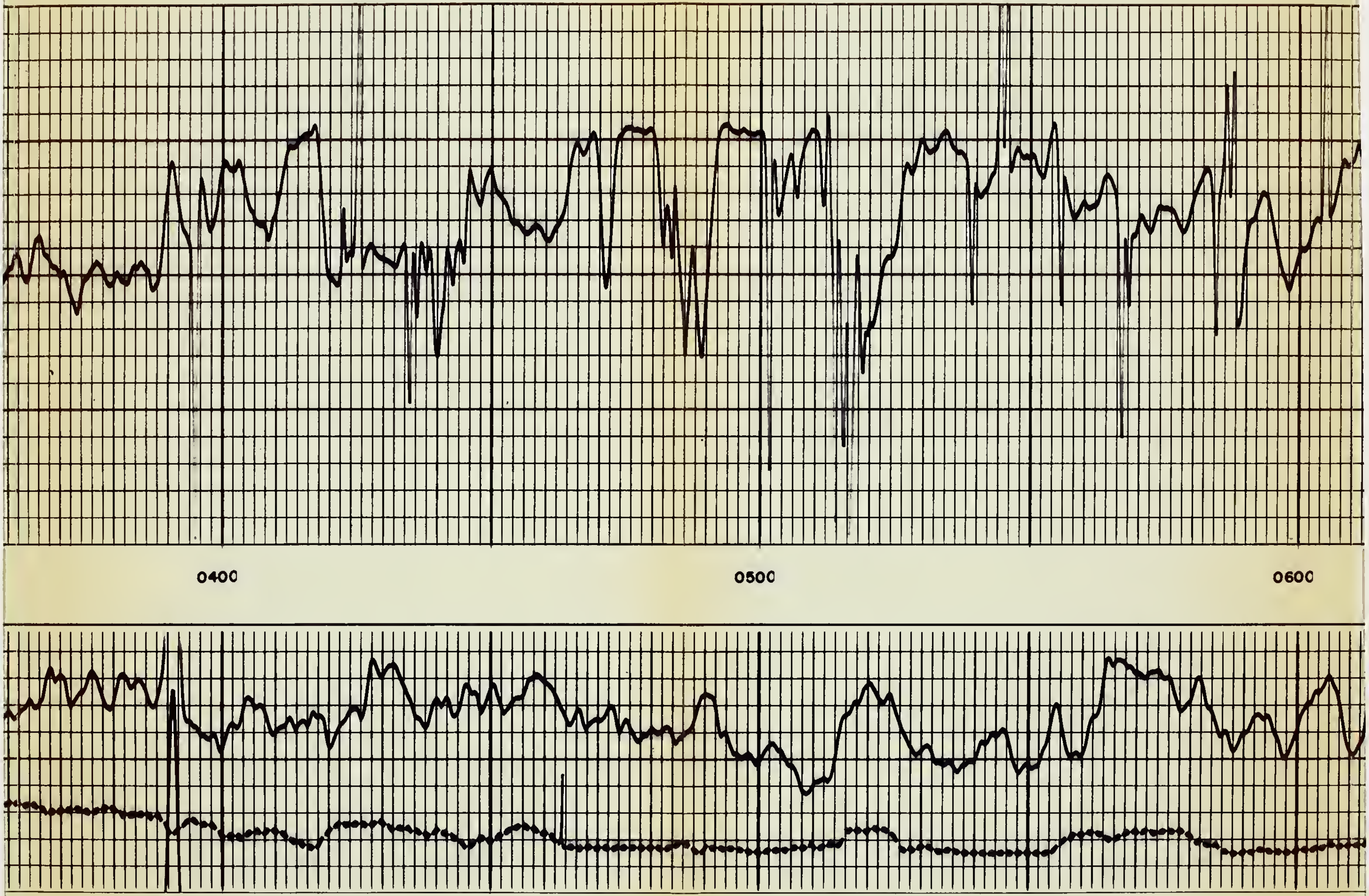

0600
0700
0800
0900
1000
1100
12

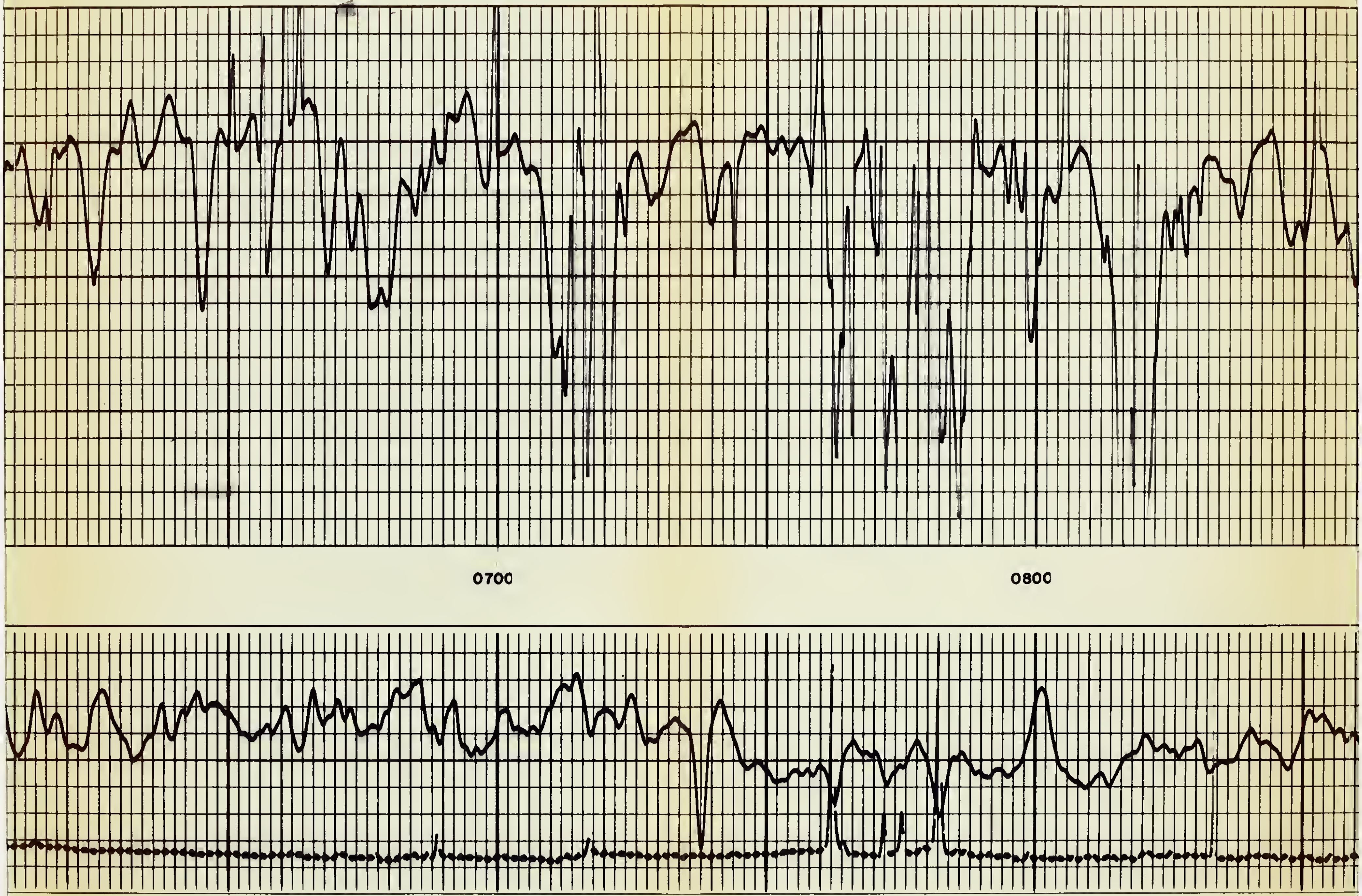

1200
1300
1400
1500
1600
1700
1800


1900
2000
2100
2200
2300
2400


ΔT
Caliper
GR
2500
2600
DETAIL LOG
5″ = 100′
INTERVAL TRANSIT TIME MICROSECONDS PER FOOT
T 3 R1 2 R2
150
100
50
DEPTH
CALIPER DIAM. IN INCHES
5 CORRELATION ONLY 15
GAMMA RAY API UNITS
0 150
150 300
000C
LR
0100


ΔT
Casing
0200
0300
Caliper
GR


0400
0500
0600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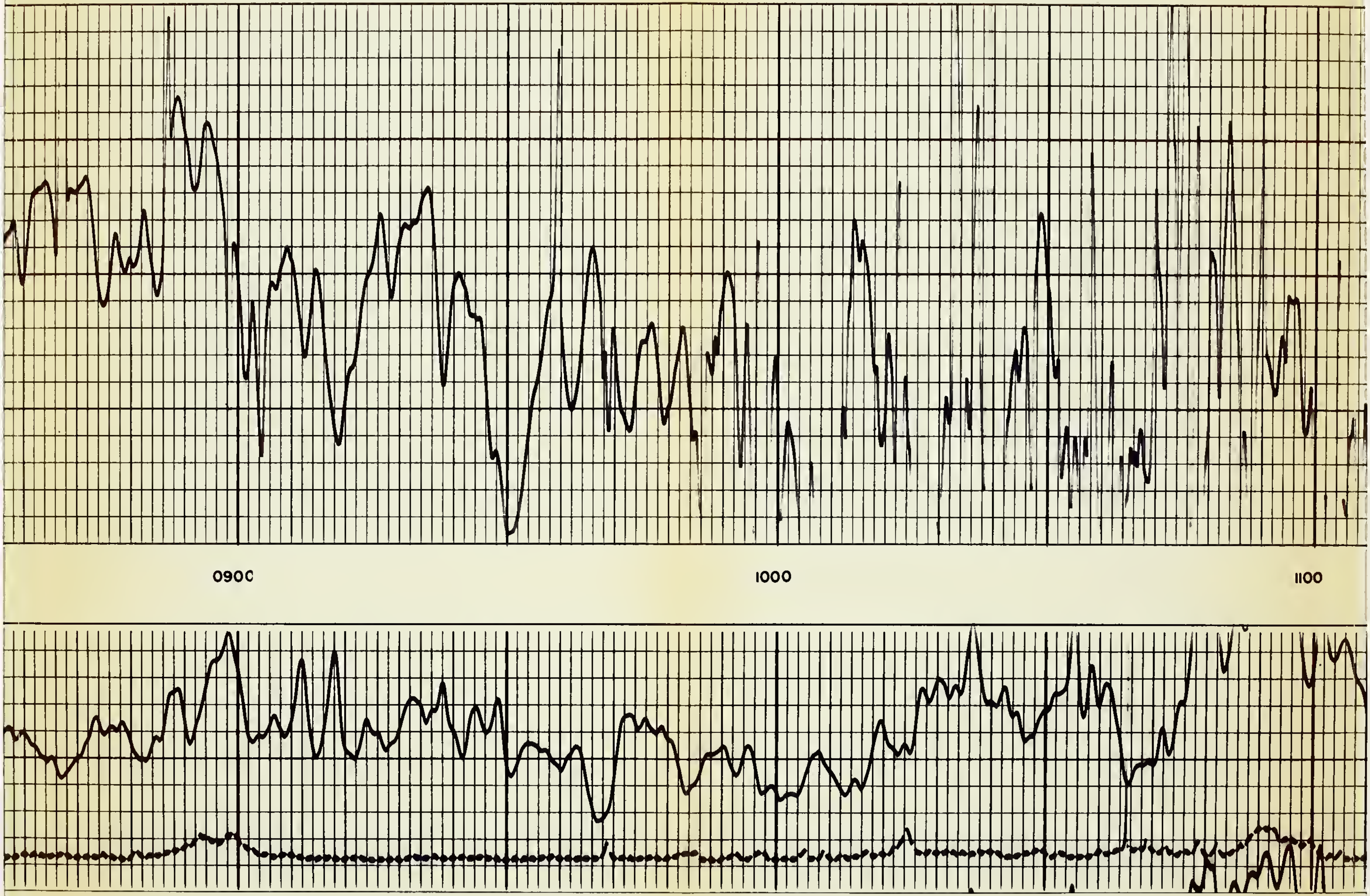
0800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1000
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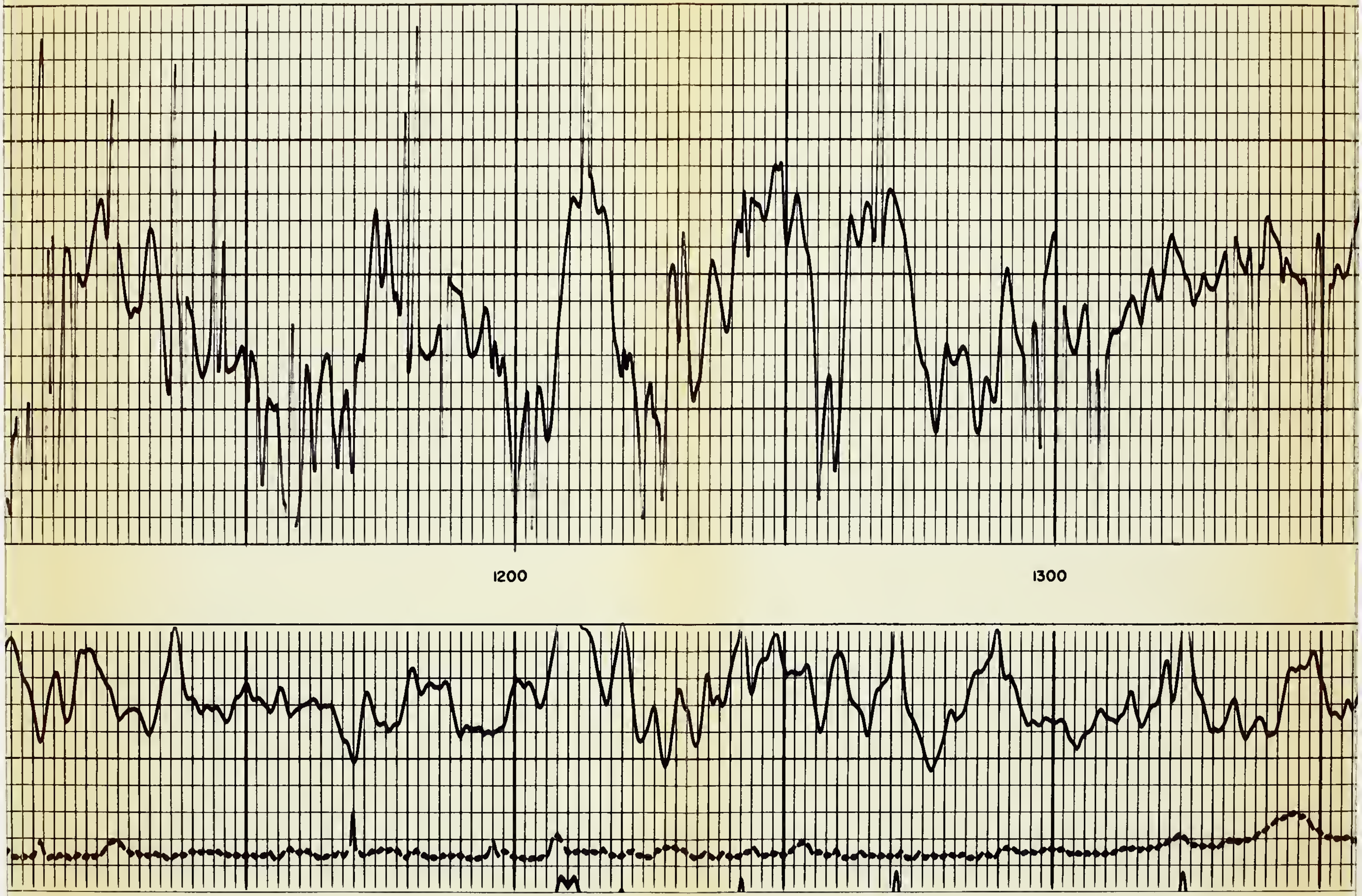
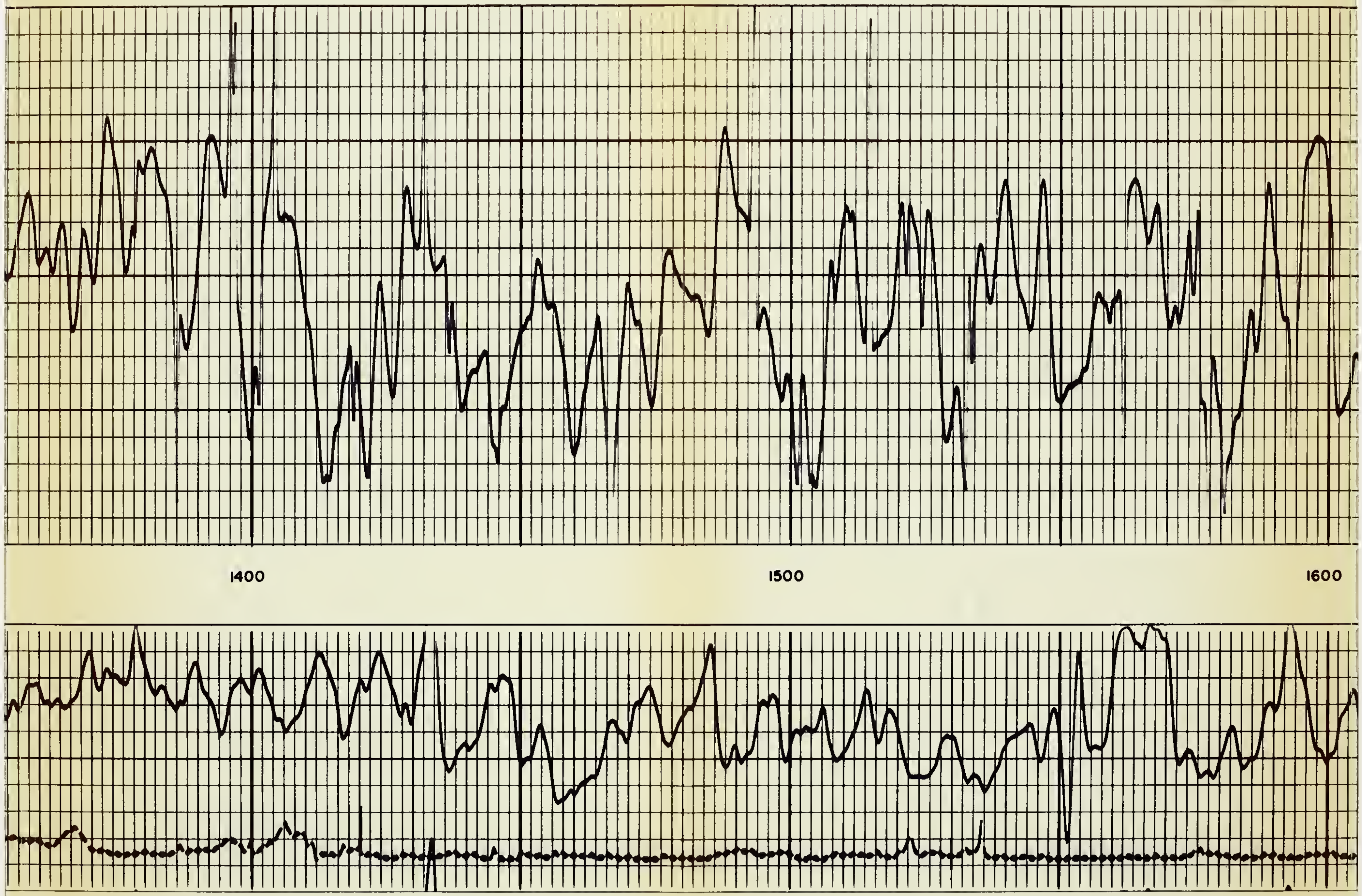
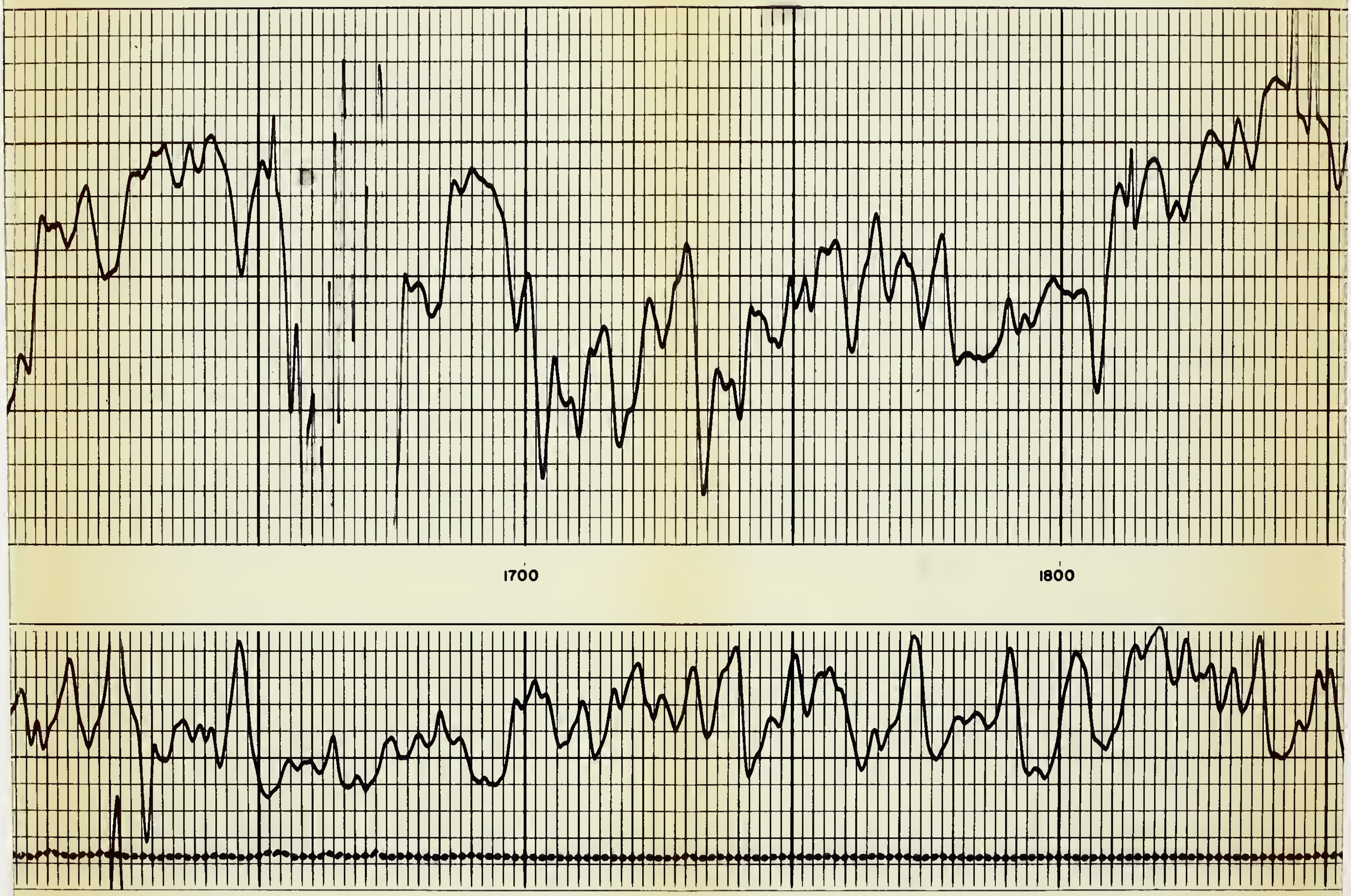

1200
1300


1400
1500
1600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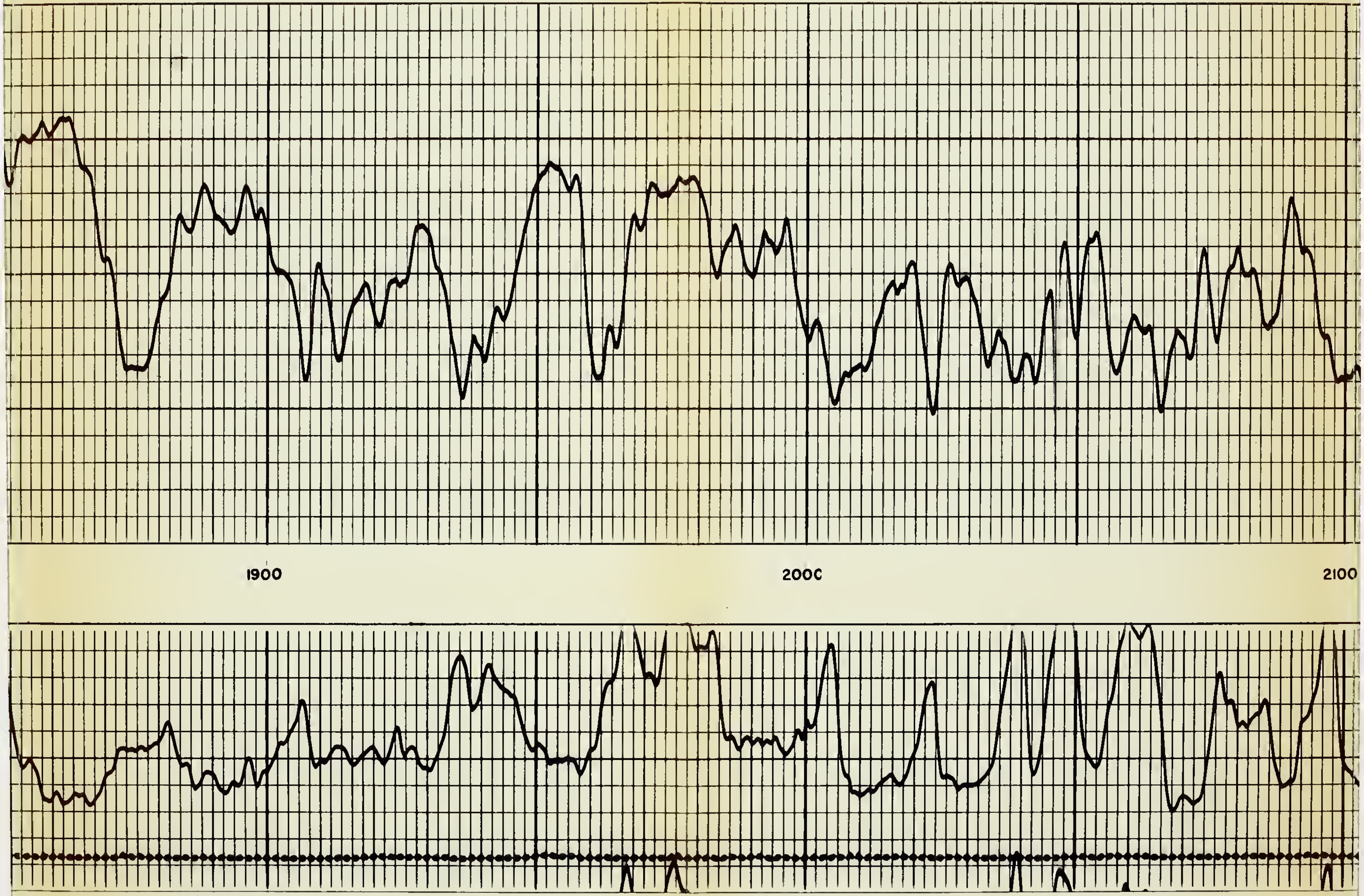
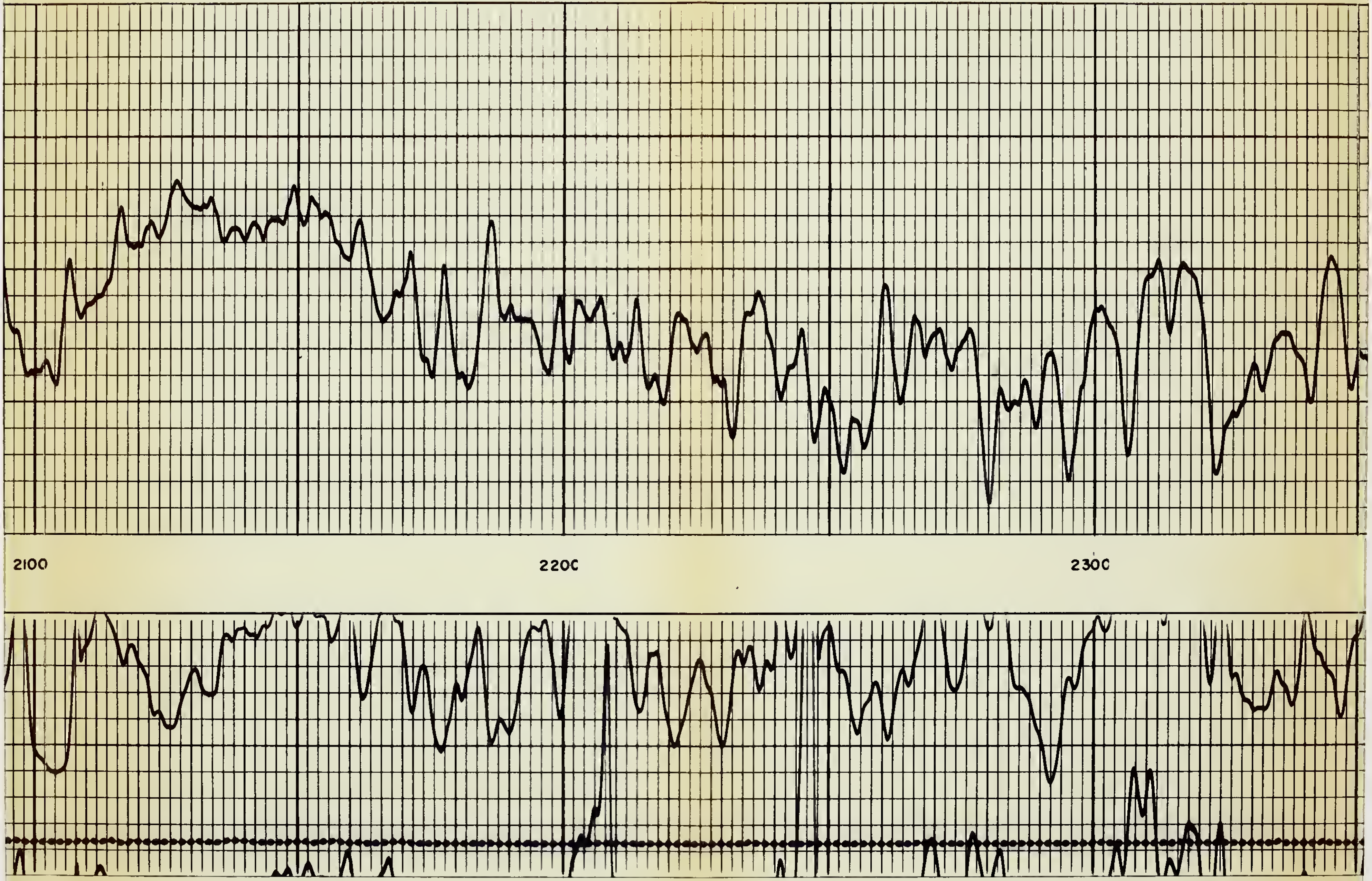
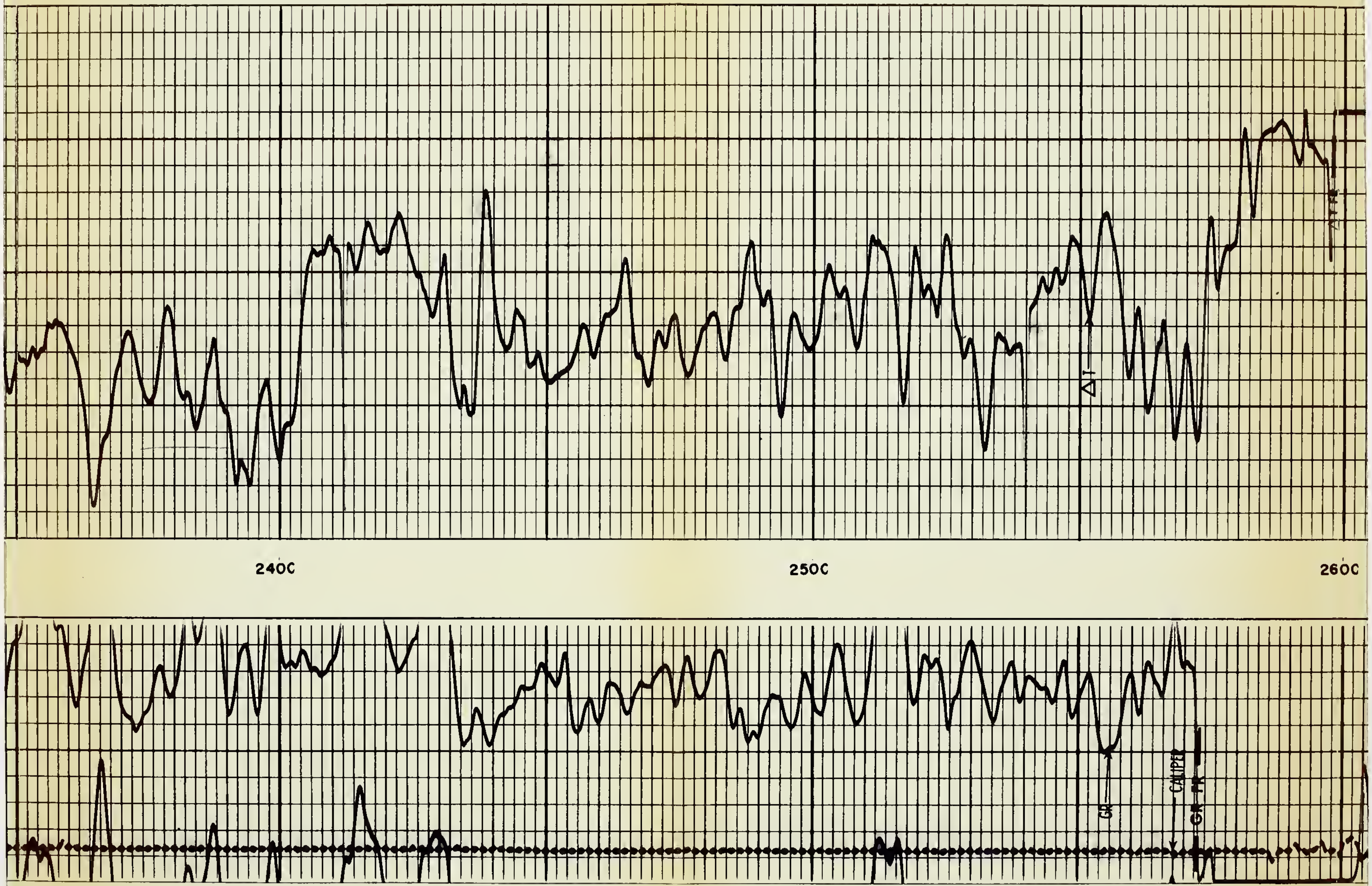
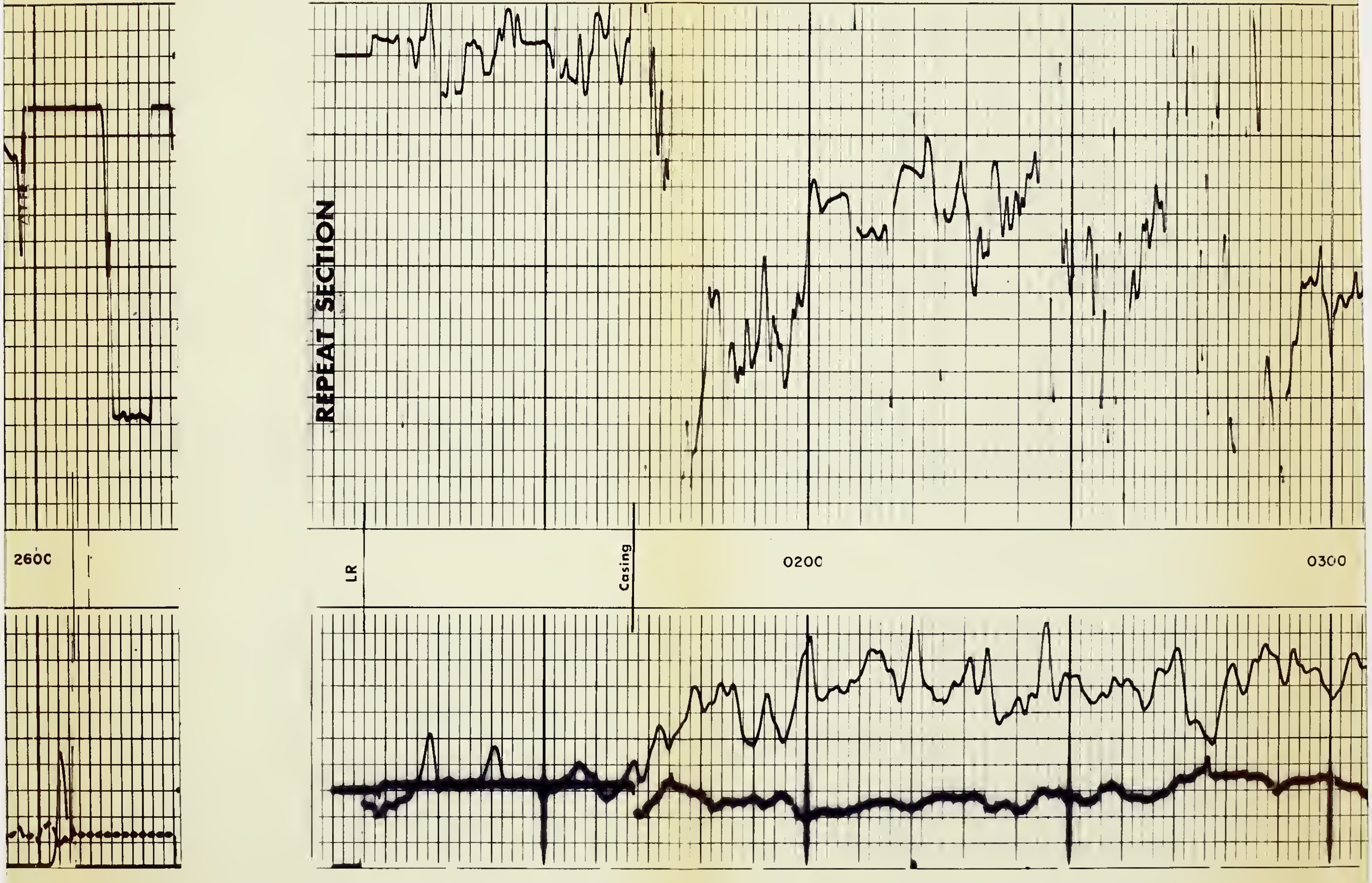
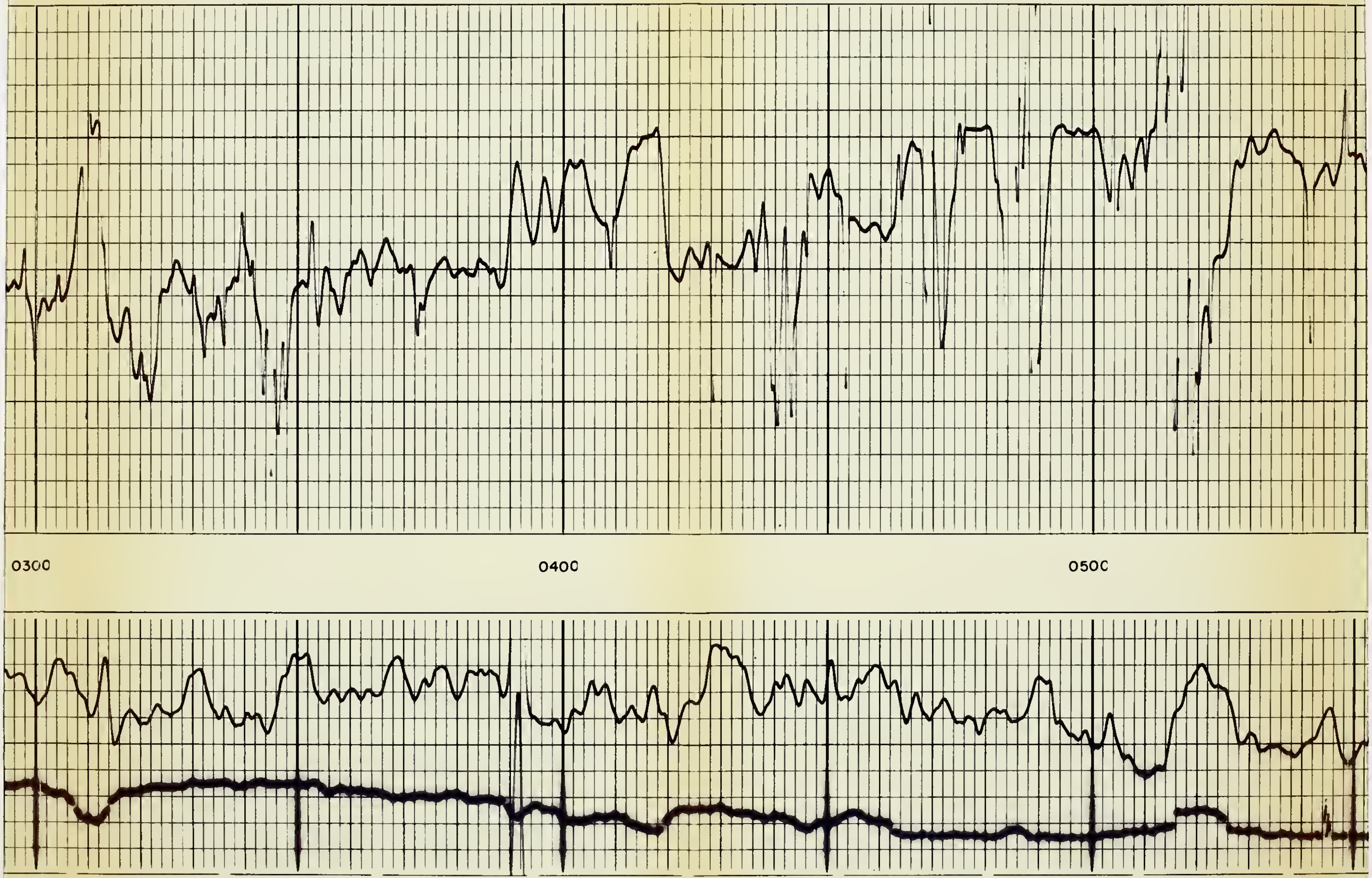
1800


1900
2000
2100


2100
2200
2300


2400
2500
2600
ΔT
ATM
GR
CALIPER
GR FR


REPEAT SECTION
2600
LR
Casing
0200
0300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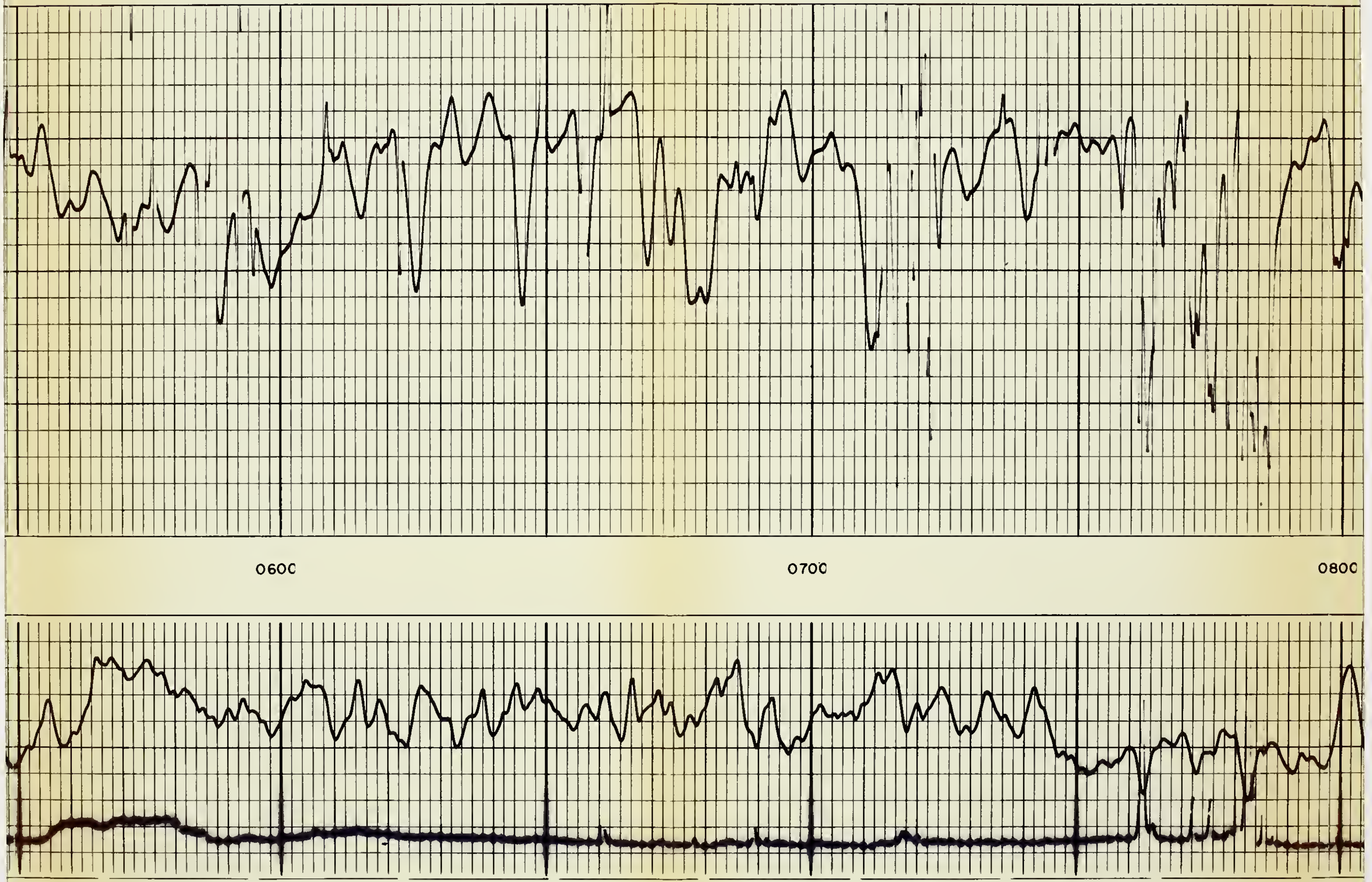
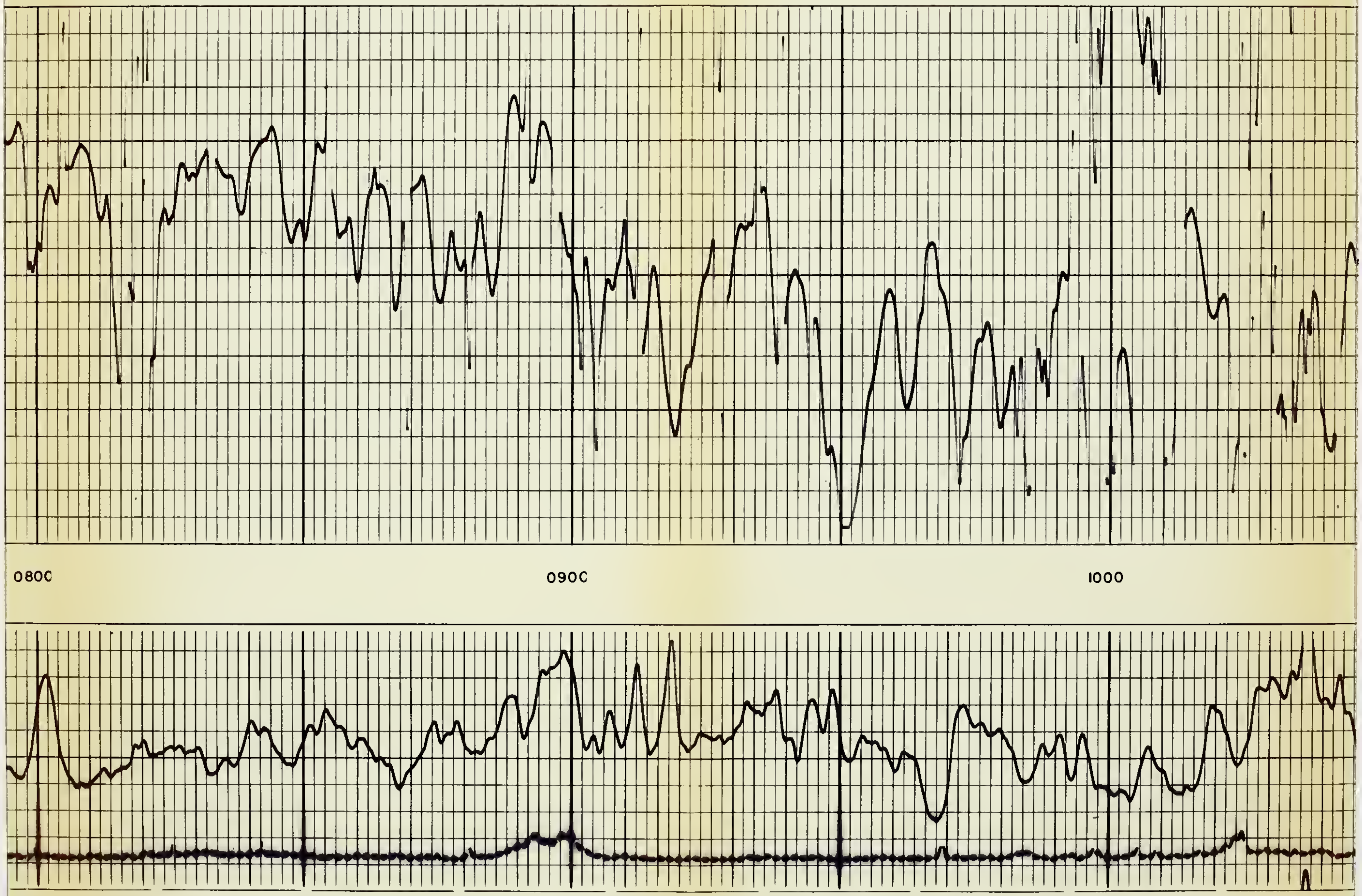
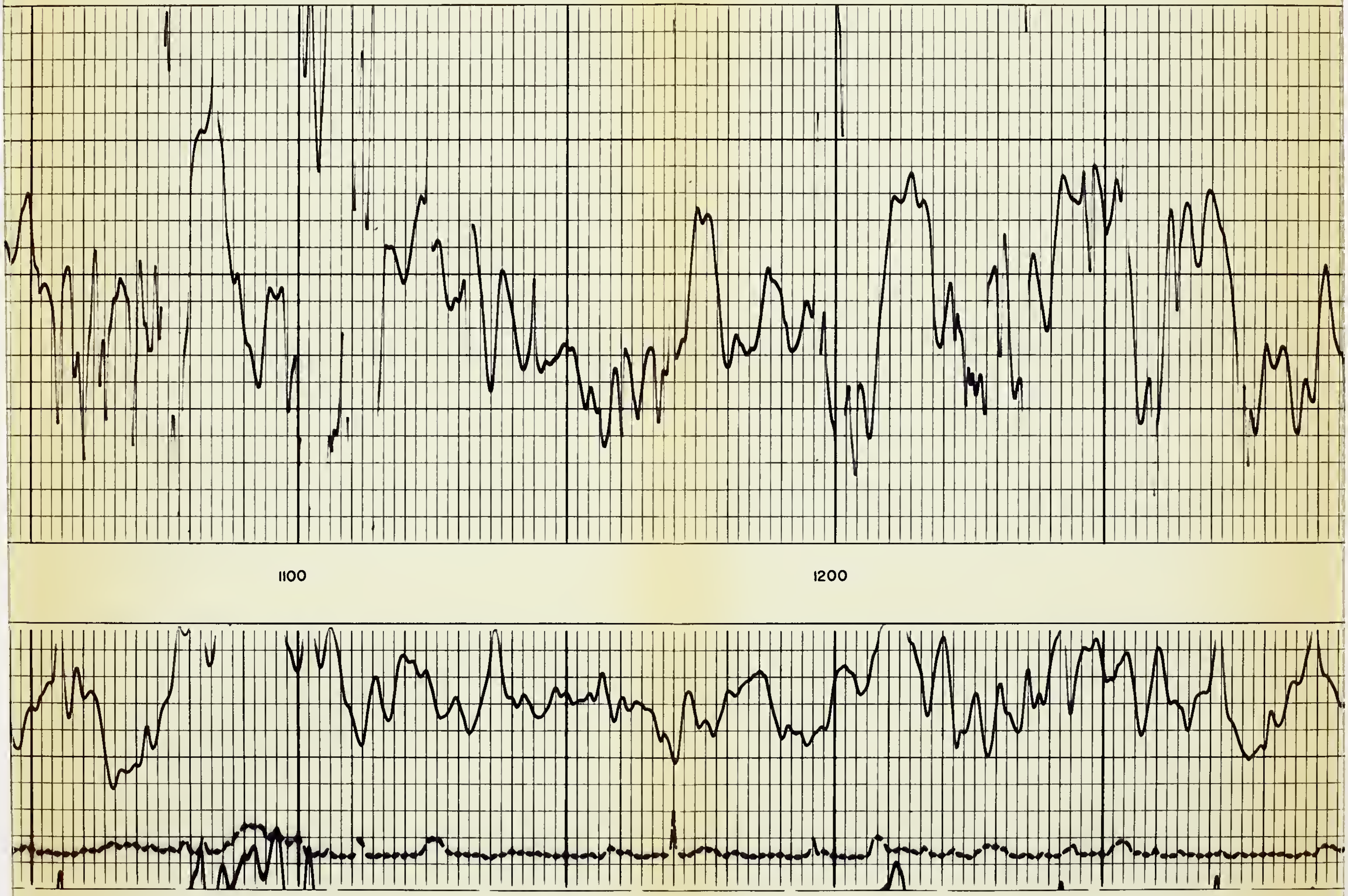
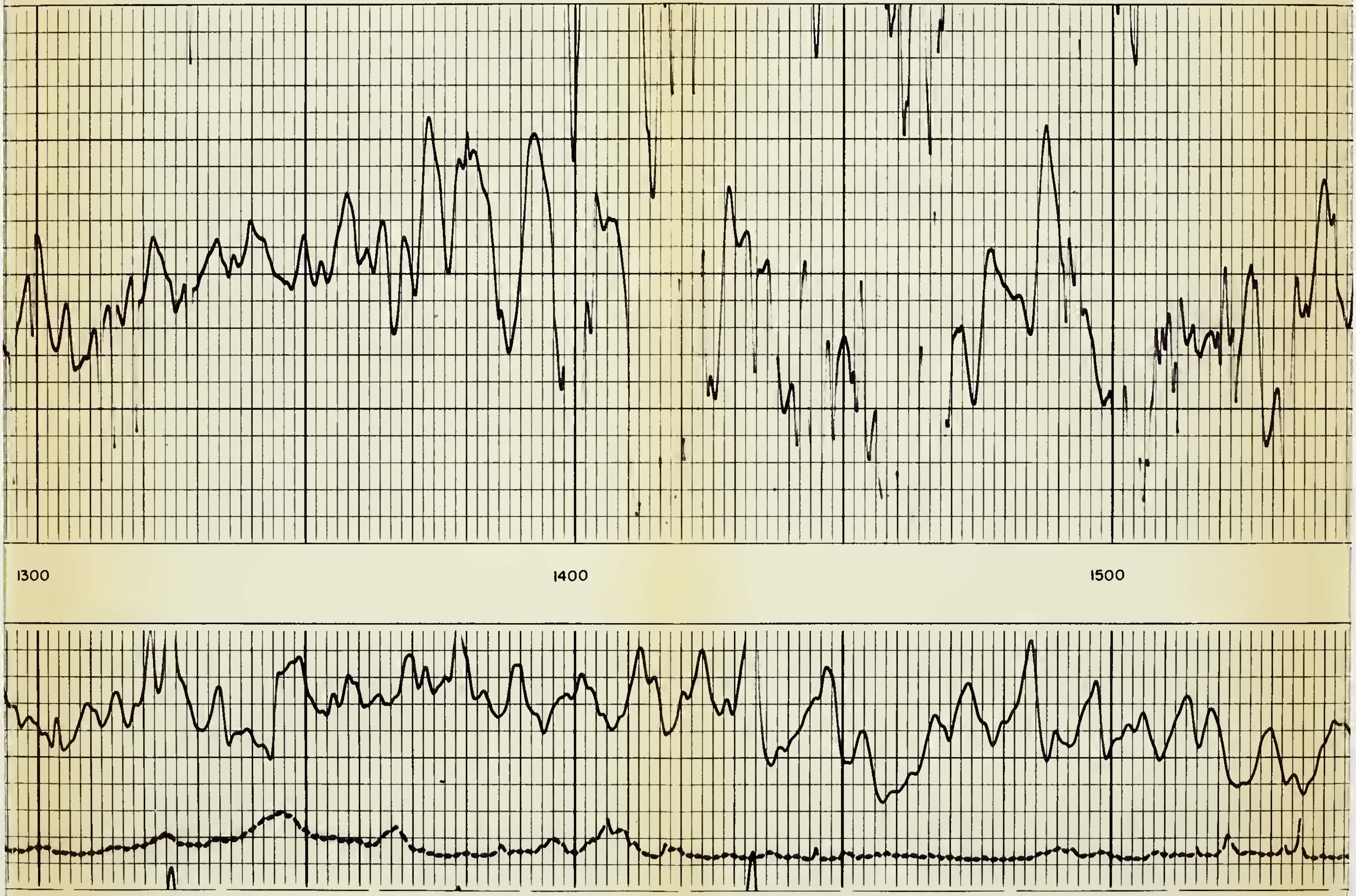
0400
0500


0600
0700
0800


0800
0900
1000


1100
1200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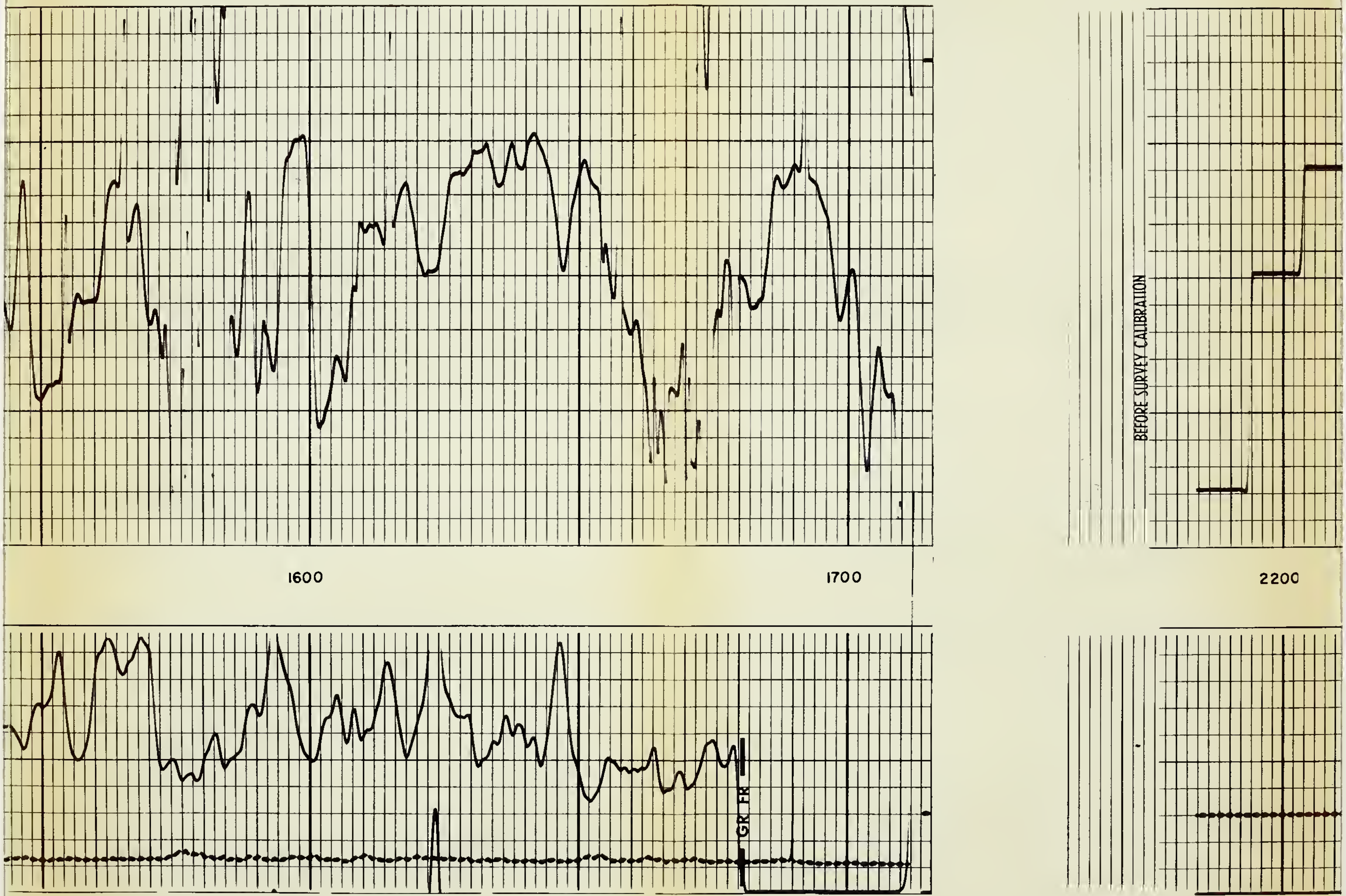
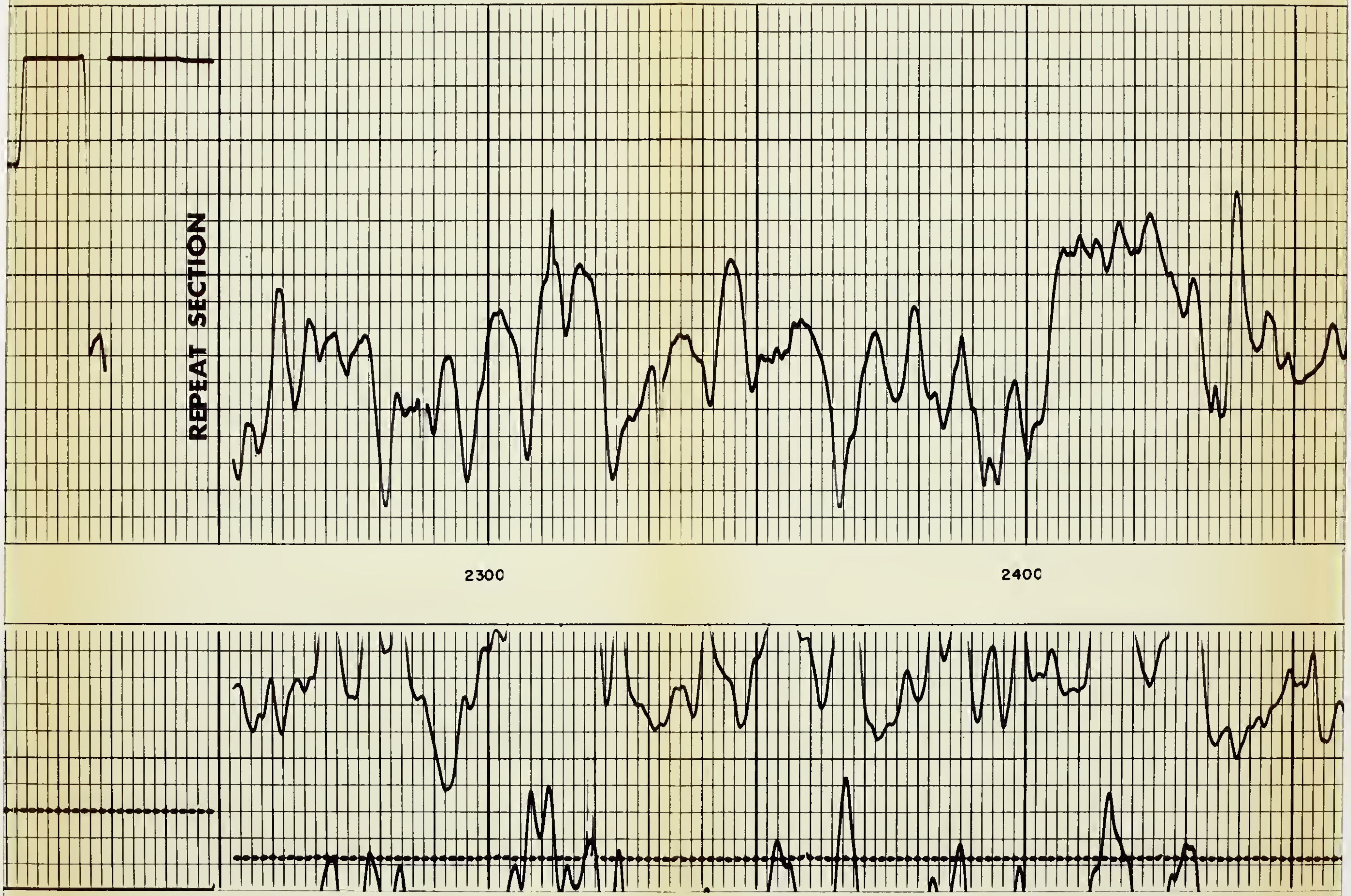
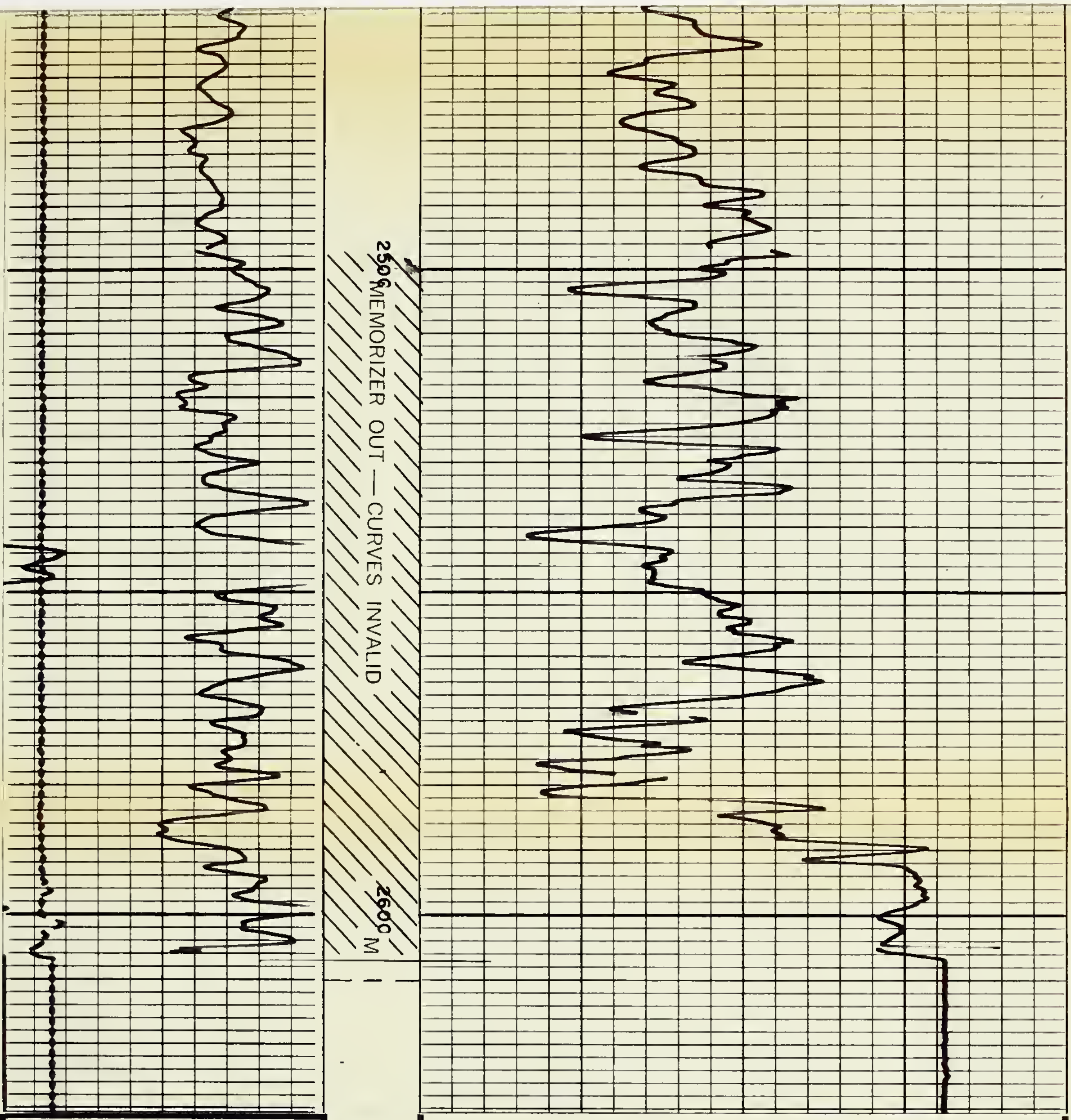

1600
1700
BEFORE SURVEY CALIBRATION
2200
GR FR


REPEAT SECTION
2300
2400



GAMMA RAY API UNITS

0	150
150	300

CALIPER DIAM. IN INCHES

5 CORRELATION ONLY 15

DEPTH

INTERVAL TRANSIT TIME MICROSECONDS PER FOOT T 3 R₁ 2 R₂

150	100	50
	200	150

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #8

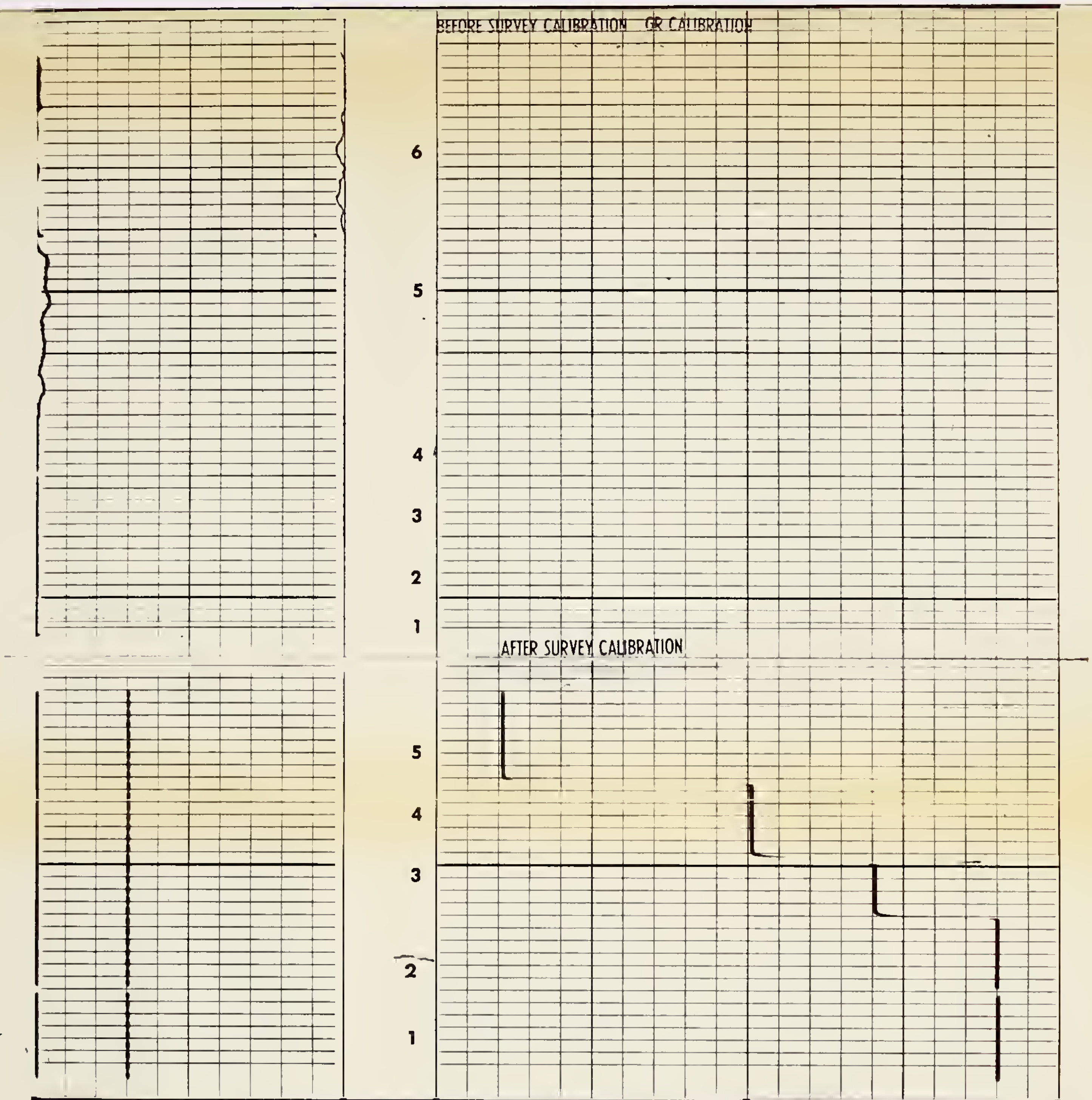
FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2607
SCHL. TD 2610
DRLR TD 2608
Elev:
KB ----
DF 6542
GL 6538

CALIBRATION RECORD

BEFORE SURVEY CALIBRATION GR CALIBRATION



BOREHOLE COMPENSATED SONIC CALIBRATION CODING

1. MECHANICAL ZERO
2. 40 μ SEC/FT
3. 60 μ SEC/FT
4. 80 μ SEC/FT
5. 100 μ SEC/FT
6. 140 μ SEC/FT

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATION

CALIBRATION RECORD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #8

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2607
SCHL. TD 2612
DRLR TD 2608
Elev:
KB ----
DF 6542
GL 6538

SWS 1129-D

Schlumberger

LATEROLOG
WITH GAMMA RAY

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #8
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #8

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION PERMIT #28182
2600' FWL & 2301' FSL

Sec. 9 Twp. 35S Rge. 96W

Other Services:
BHC-GR
FDC-GR
HRT AMP-VDL

Permanent Datum: GL, Elev. 6538
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. 6542
G.L. 6538

Date	11-28-74			
Run No.	ONE			
Depth—Driller	2608			
Depth—Logger	2614			
Btm. Log Interval	2610			
Top Log Interval	176			
Casing—Driller	8 5/8@176	@	@	@
Casing—Logger	176			
Bit Size	6-1/4			
Type Fluid in Hole	WATER			
Dens. | Visc.				
pH | Fluid Loss	ml	ml	ml	ml
Source of Sample	MUDPIT			
R_m @ Meas. Temp.	3.79@68 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	CLEAR °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	WATER °F	@ °F	@ °F	@ °F
Source: R_{mf} | R_{mc}	AIR DRILLED			
R_m @ BHT	2.05@126 °F	@ °F	@ °F	@ °F
Time Since Circ.	1700 HOURS			
Max. Rec. Temp.	126 °F	°F	°F	°F
Equip. | Location	7674 | VRNL			
Recorded By	DALTON-ETTER			
Witnessed By	BURNS-TAIT			

FOLD HERE The well name, location and borehole reference data were furnished by the customer.

REMARKS SERVICE ORDER NO. 28182

Changes in Mud Type or Additional Samples		
Date | Sample No.		
Depth—Driller		
Type Fluid in Hole		
Dens. | Visc.		
pH | Fluid Loss	ml	
Source of Sample		
R_m @ Meas. Temp.	@ °F	@ °F
R_{mf} @ Meas. Temp.	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F
Source: R_{mf} | R_{mc}		
R_m @ BHT	@ °F	@ °F
R_{mf} @ BHT	@ °F	@ °F
R_{mc} @ BHT	@ °F	@ °F

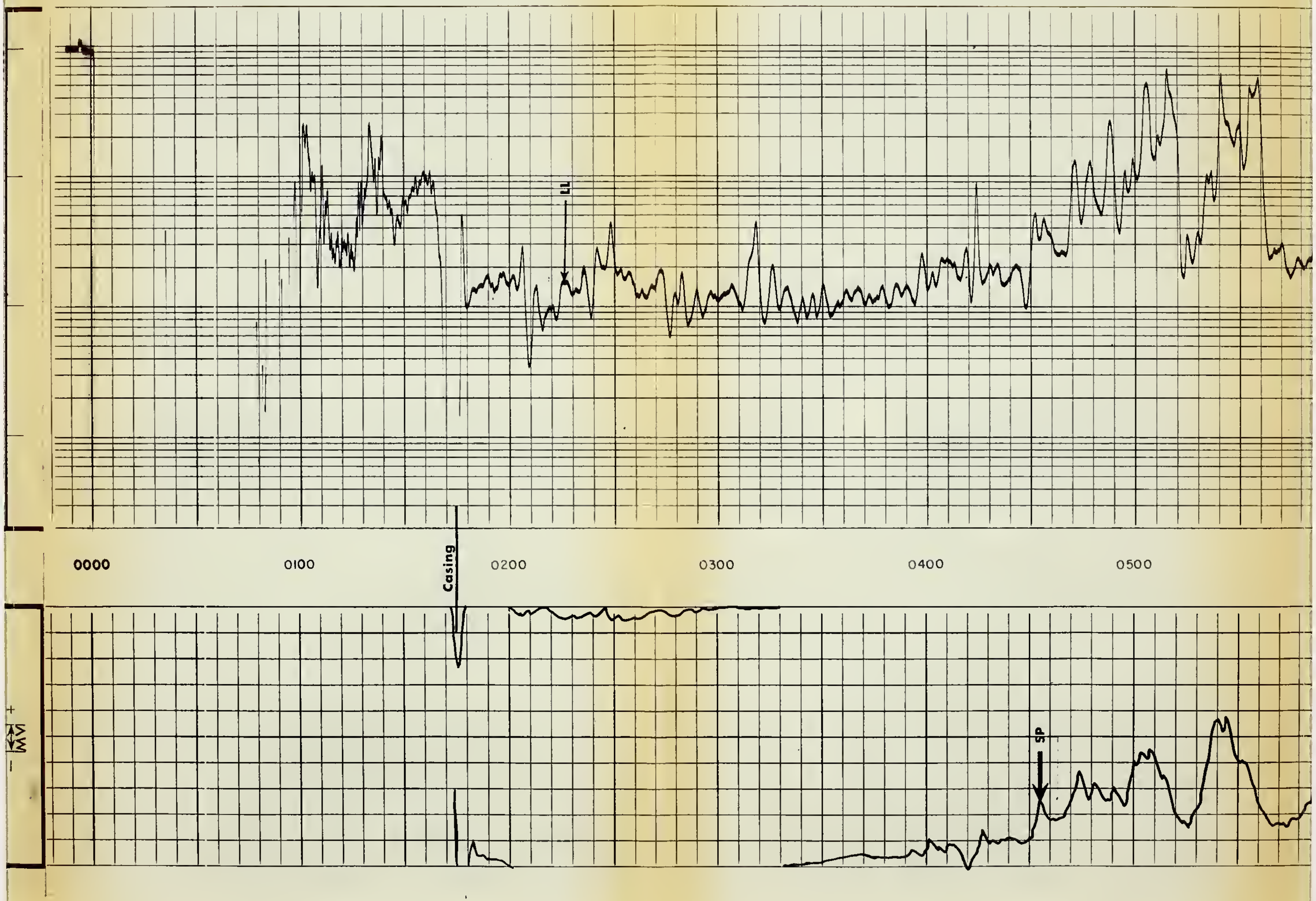
Scale Changes			
Type Log	Depth	Scale Up Hole	Scale Down Hole

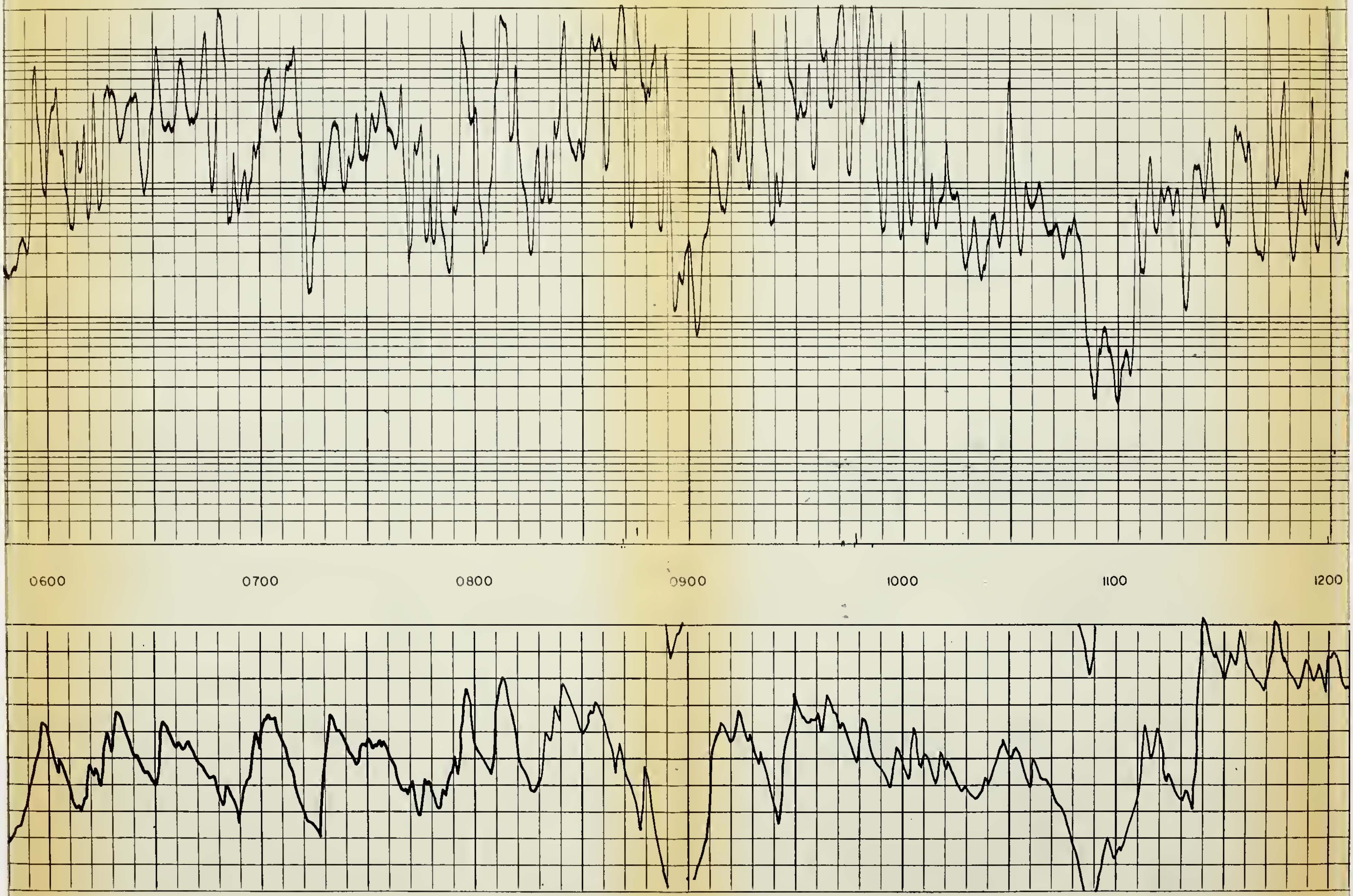
Equipment Data				
Run No.	Tool Type	Pad Type	Tool Pos.	Other

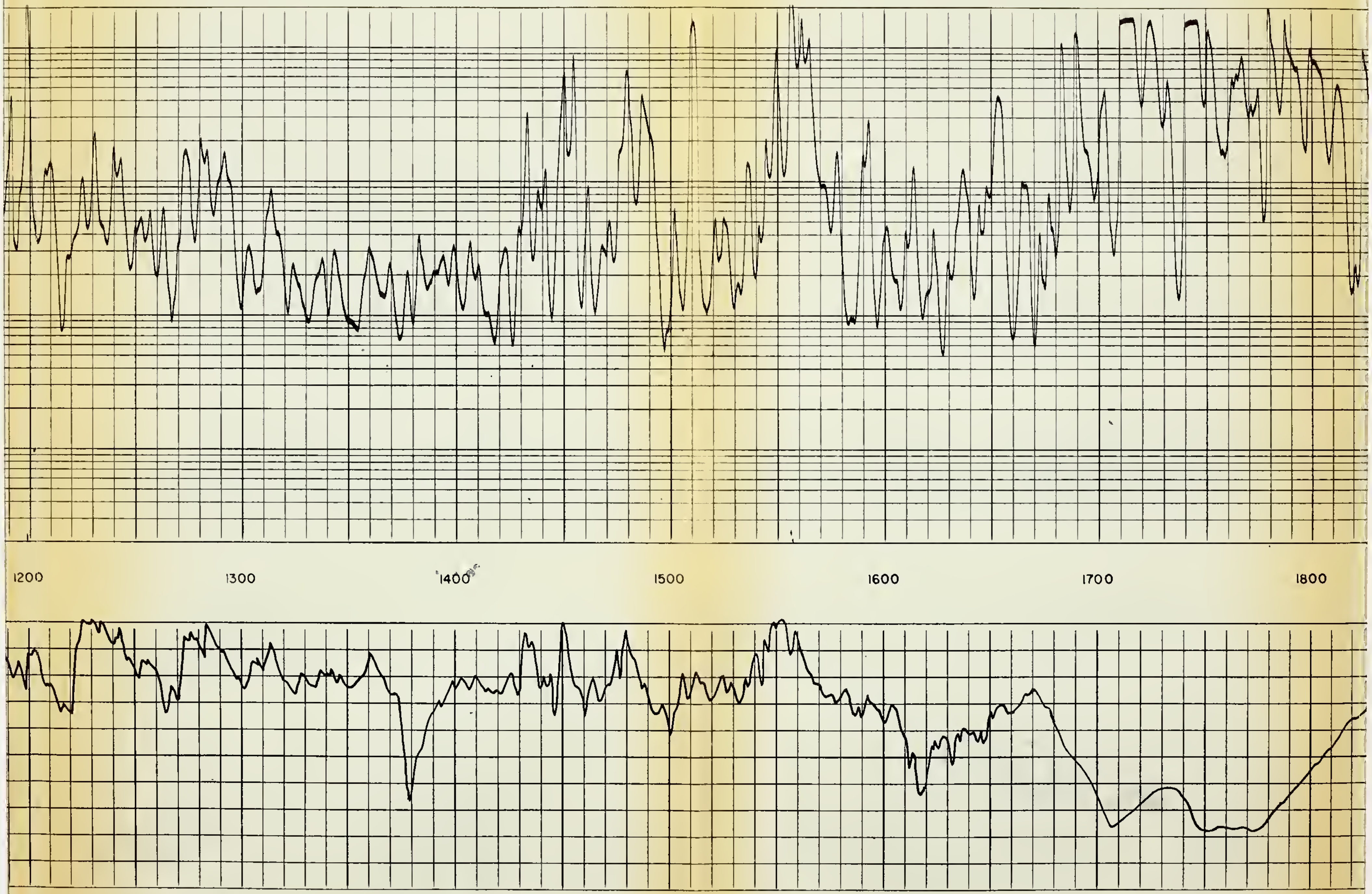
Equip. Used: CART. No.
PANEL No. FFU-G 762, LLP-D 790E, BEL-A 264, PCG-B 107
SONDE No. LLS-K 798
Spacing: BEAM WIDTH:

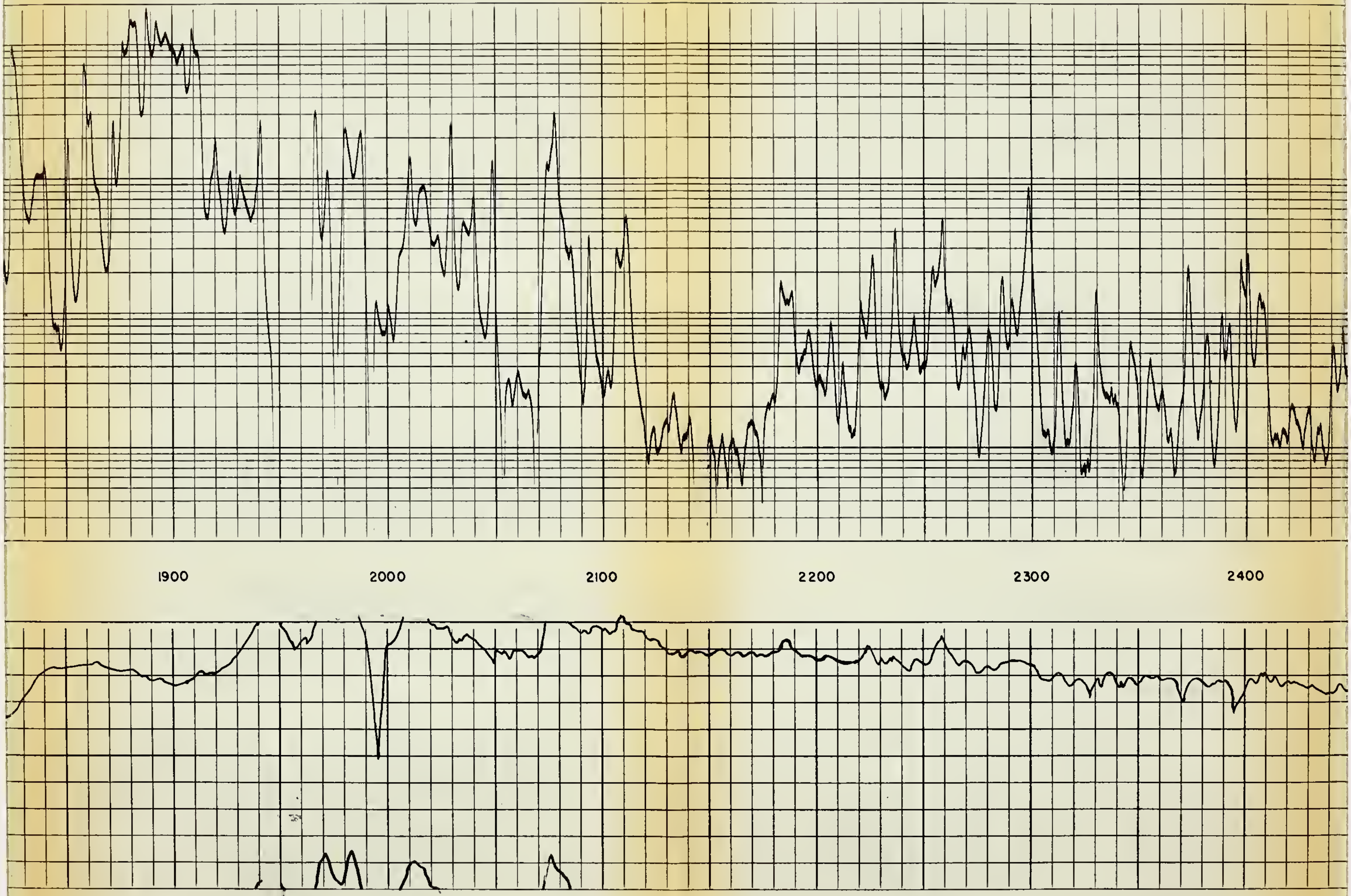
REMARKS LL-7 APPEARS ON SECOND GLANCE TO BE @3½' OFF DEPTH TO GR-BHC-FDC LOGS. LOOKED LOOKED ON DEPTH AT FIRST OVER-LAY BY ENGINEER.---GLOBS OF OIL & TAR IN HOLE AND ON TOOLS WELL PRODUCING WATER.---SP TRACED AS SP COULD NOT BE RUN WITH LL-7 AT SAME TIME AS SP WAS TOO NOISY. SP FILM HELD BY ENGINEER (DALTON).--TIME MARKER BOX BLEW CIRCUIT BREAKER SO NO SPEED INDICATOR.--LOG RUN 4000'/HR BY WORD OF DALTON & ETTER.

SPONTANEOUS POTENTIAL millivolts	Depths	RESISTIVITY ohms. m²/m
− 20 MV +		LATEROLOG 2.0 10 100 1000 10000 20000

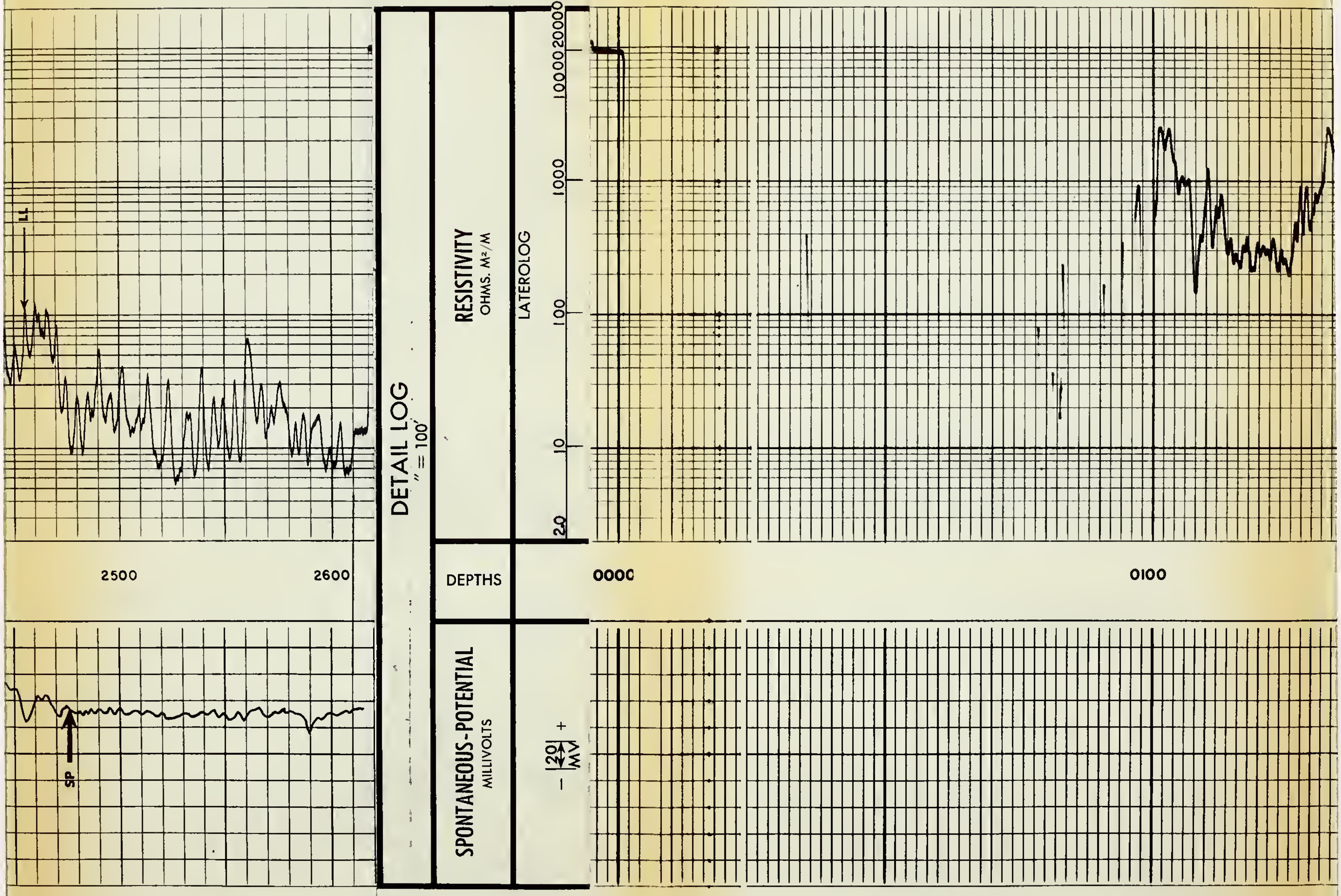

LL
0000
0100
Casing
0200
0300
0400
0500
+
MV
−
SP

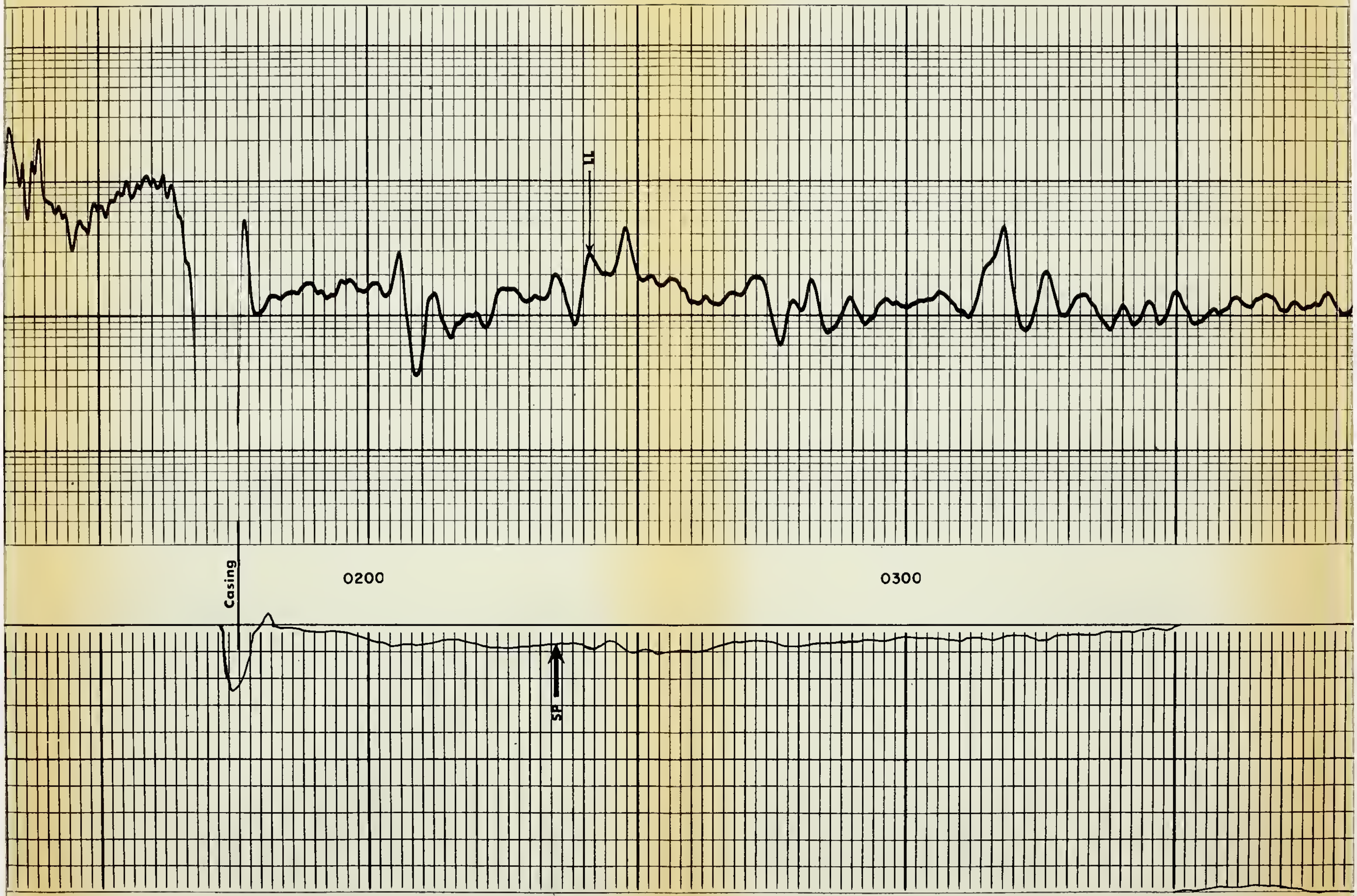

0600
0700
0800
0900
1000
1100
1200

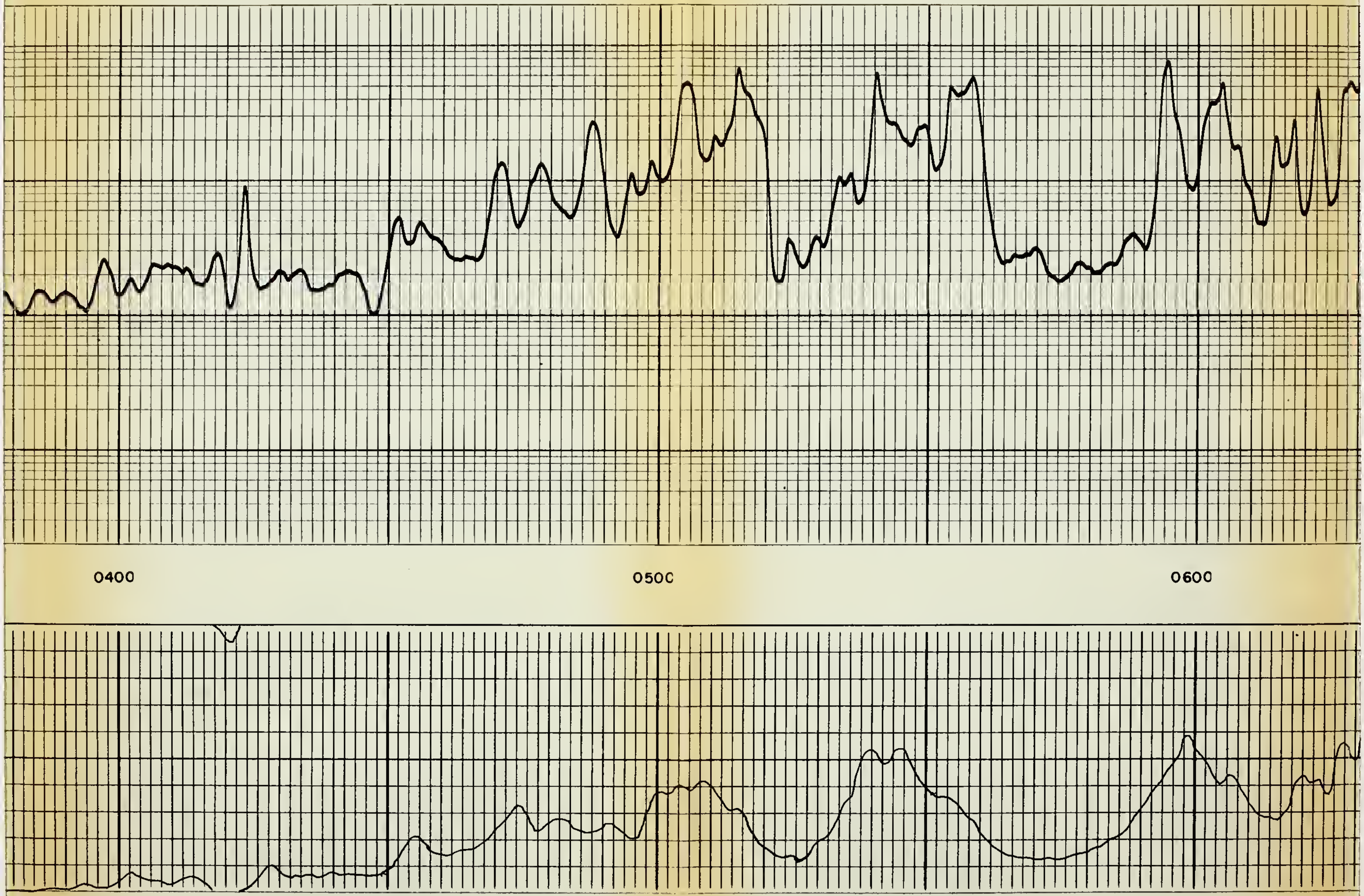

1200
1300
1400
1500
1600
1700
1800

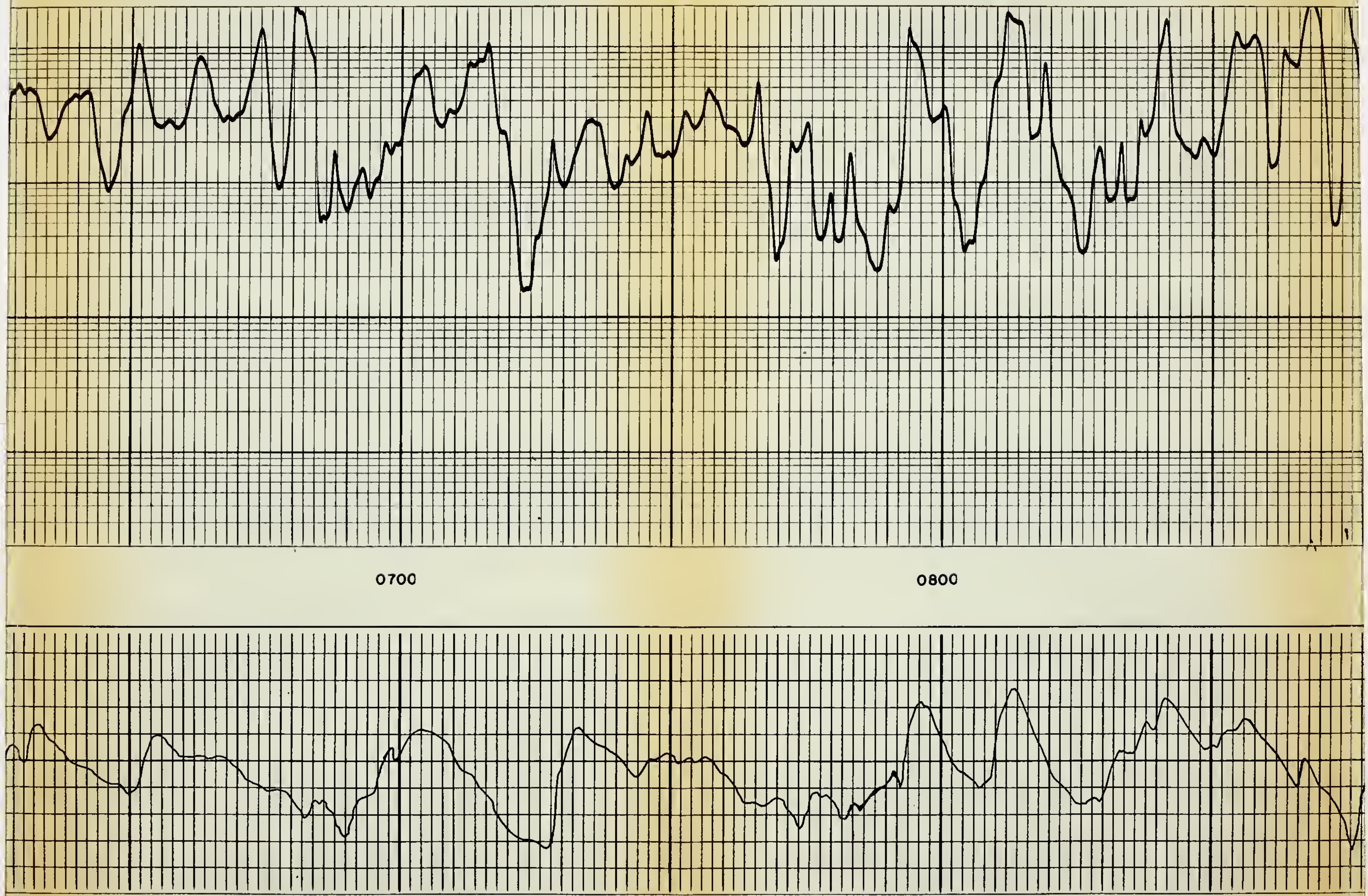


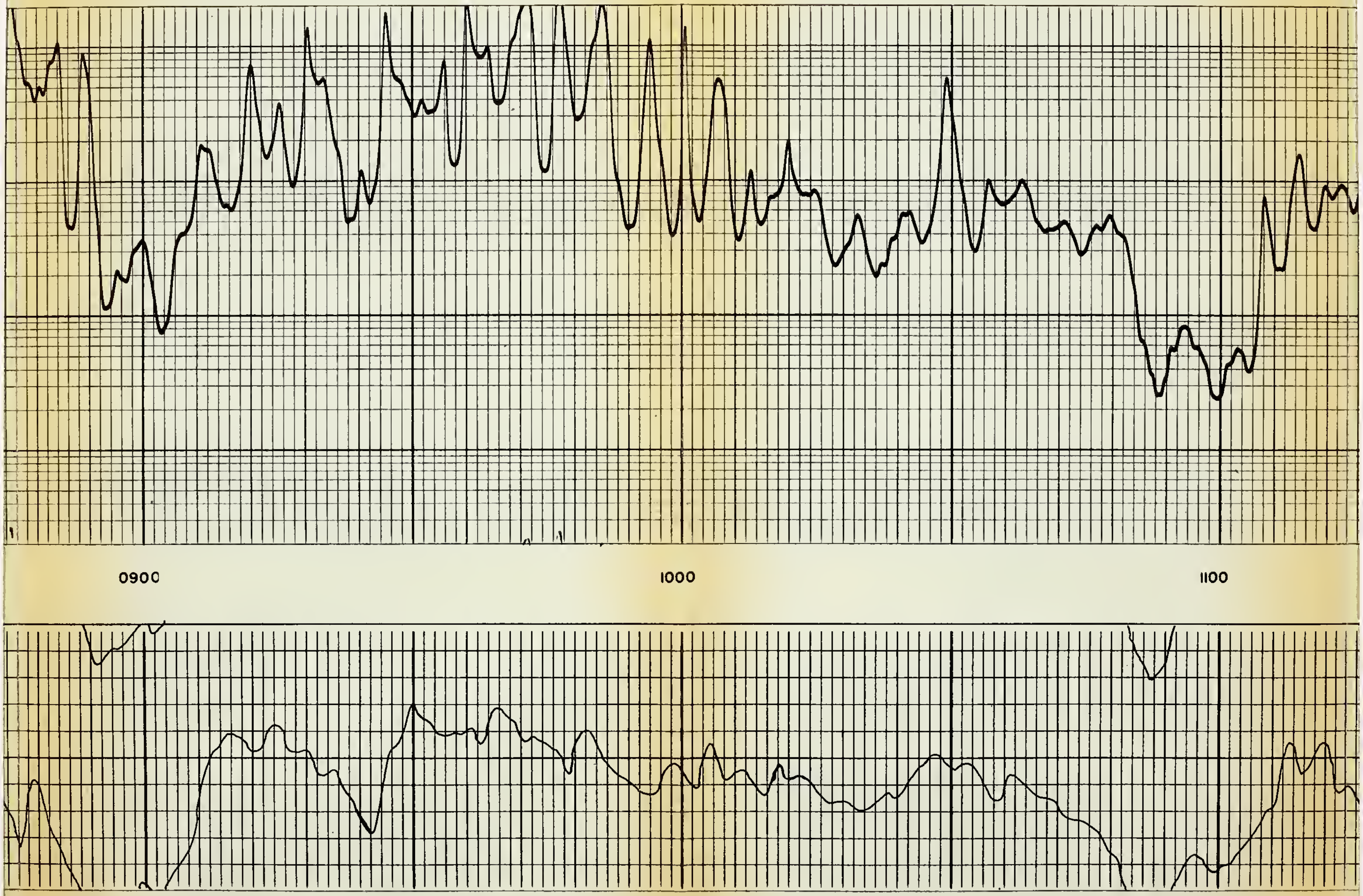
TD

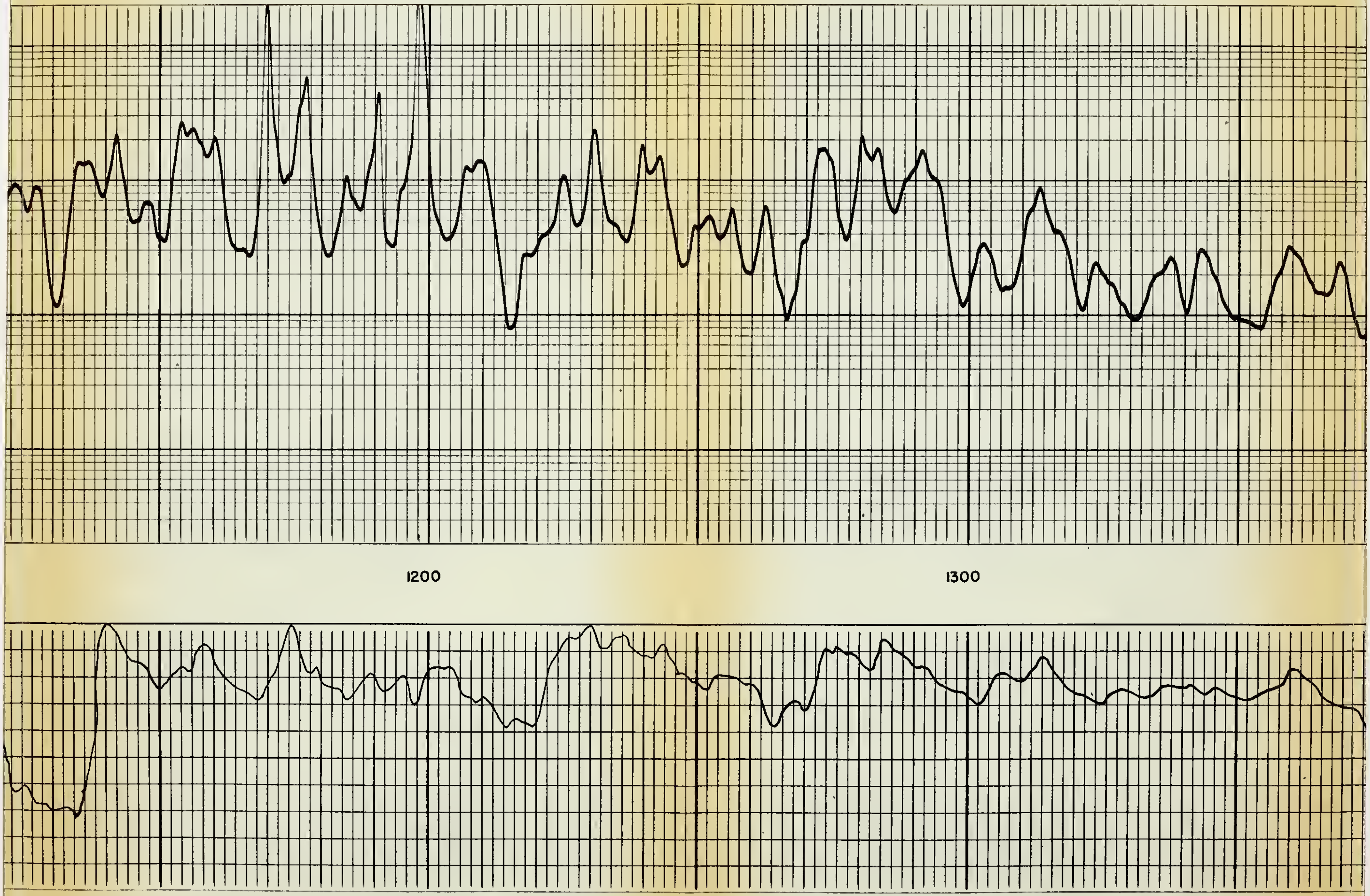

LL
SP
2500
2600
DETAIL LOG
1" = 100'
RESISTIVITY
OHMS. M²/M
LATEROLOG
20000
10000
1000
100
10
2.0
DEPTHS
0000
0100
SPONTANEOUS-POTENTIAL
MILLIVOLTS
− 20 MV +

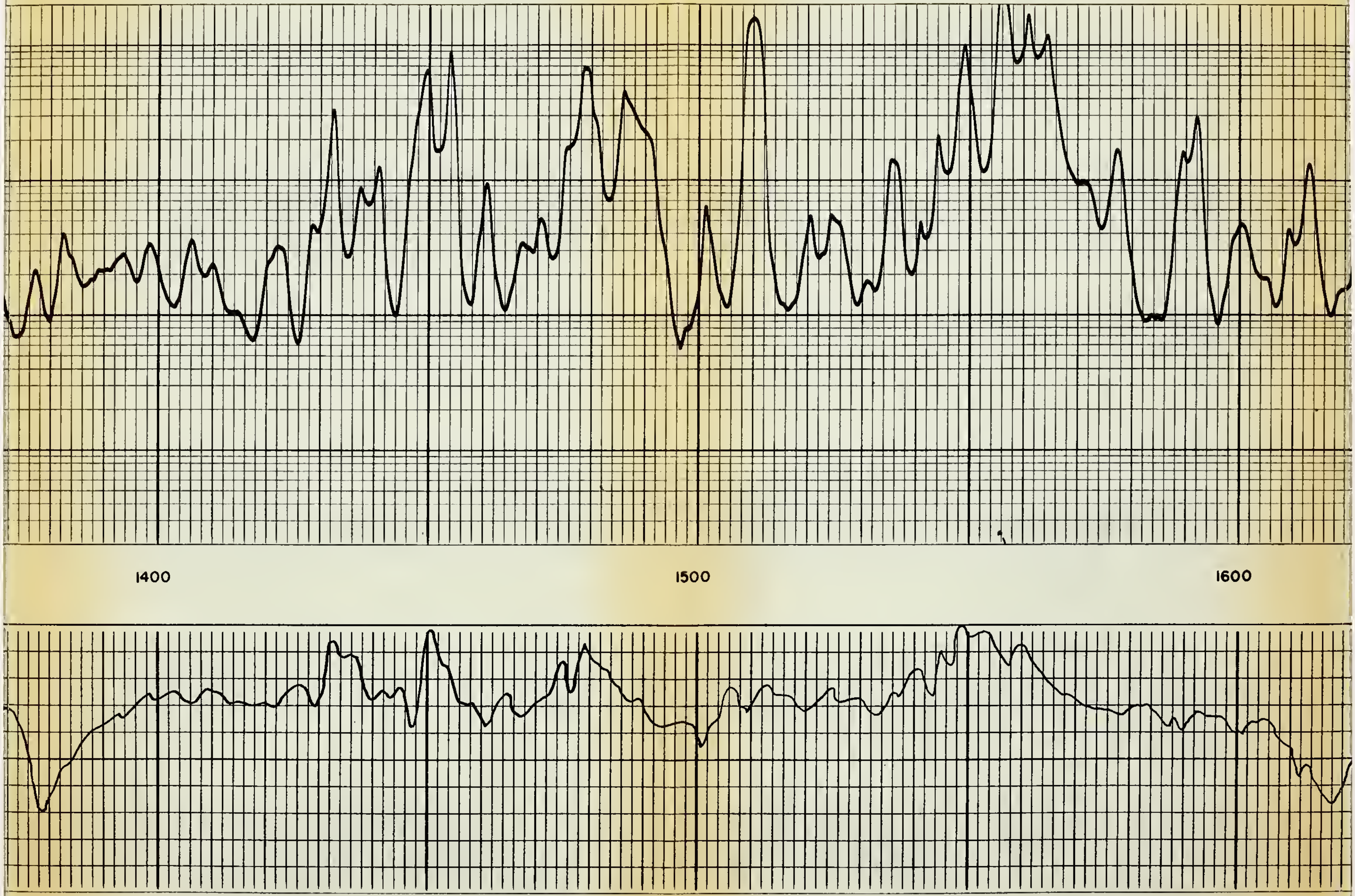

LL
Casing
0200
0300
SP


0400
0500
0600


0700
0800


0900
1000
1100


1200
1300


1400
1500
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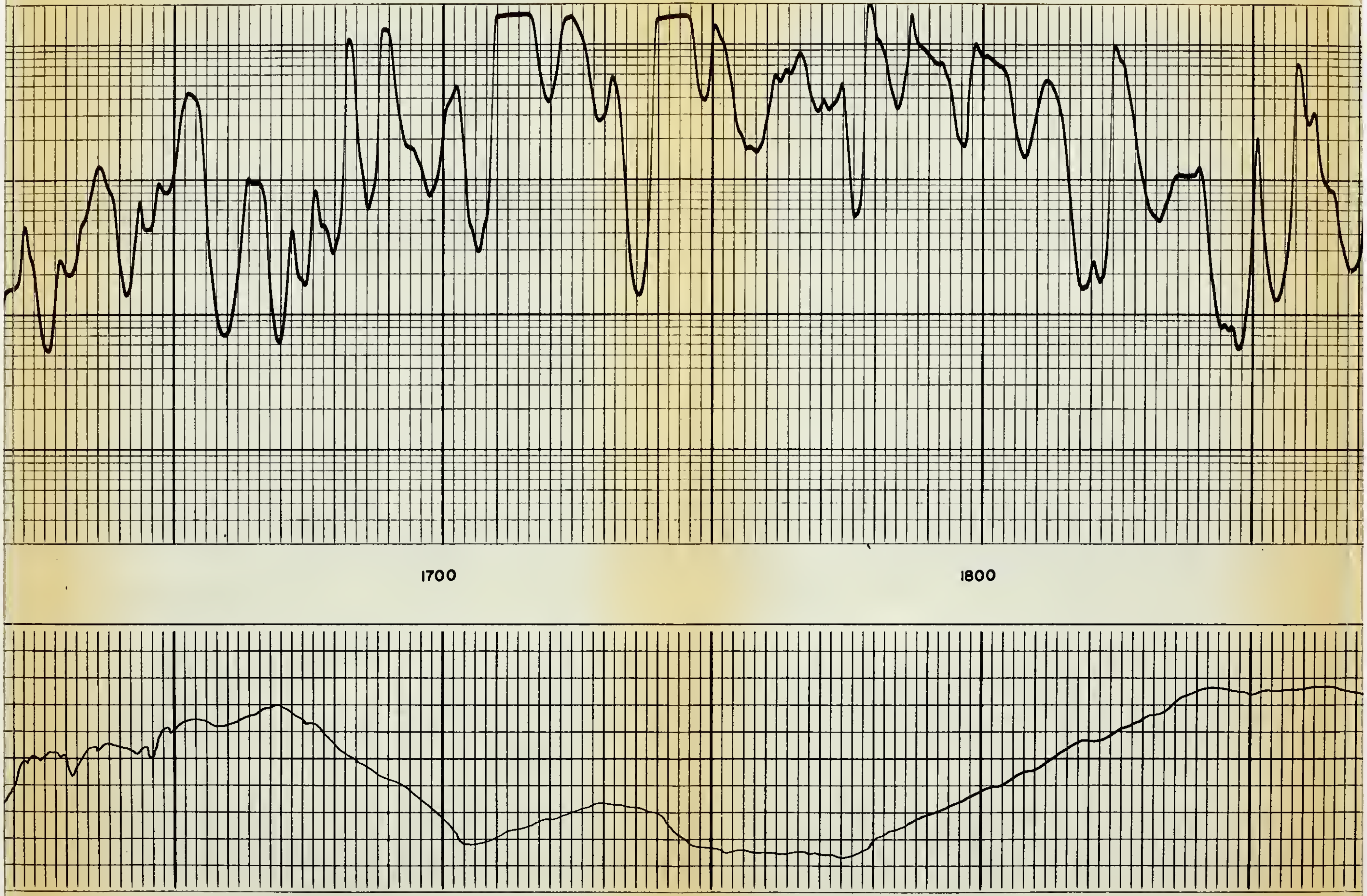
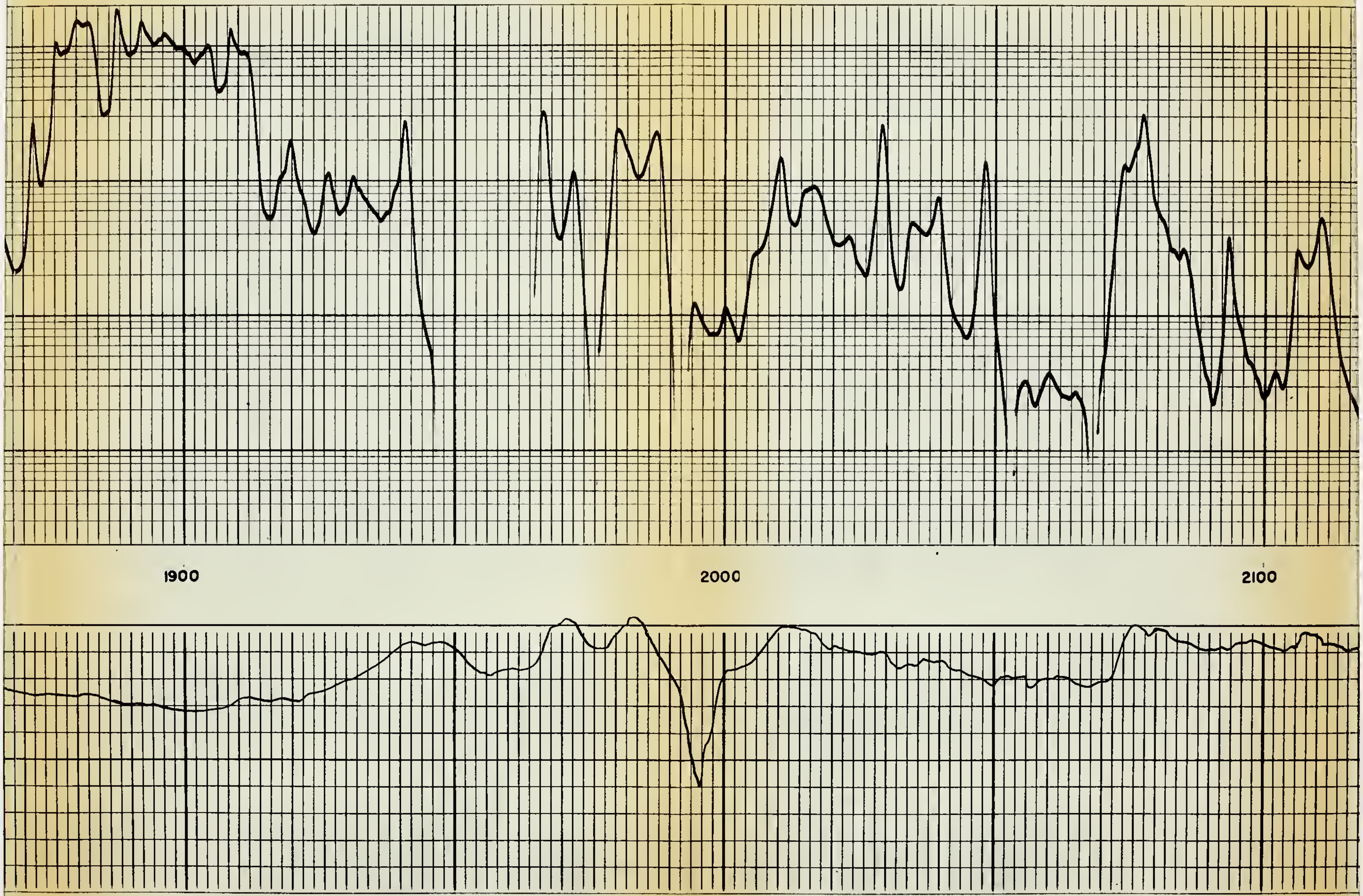
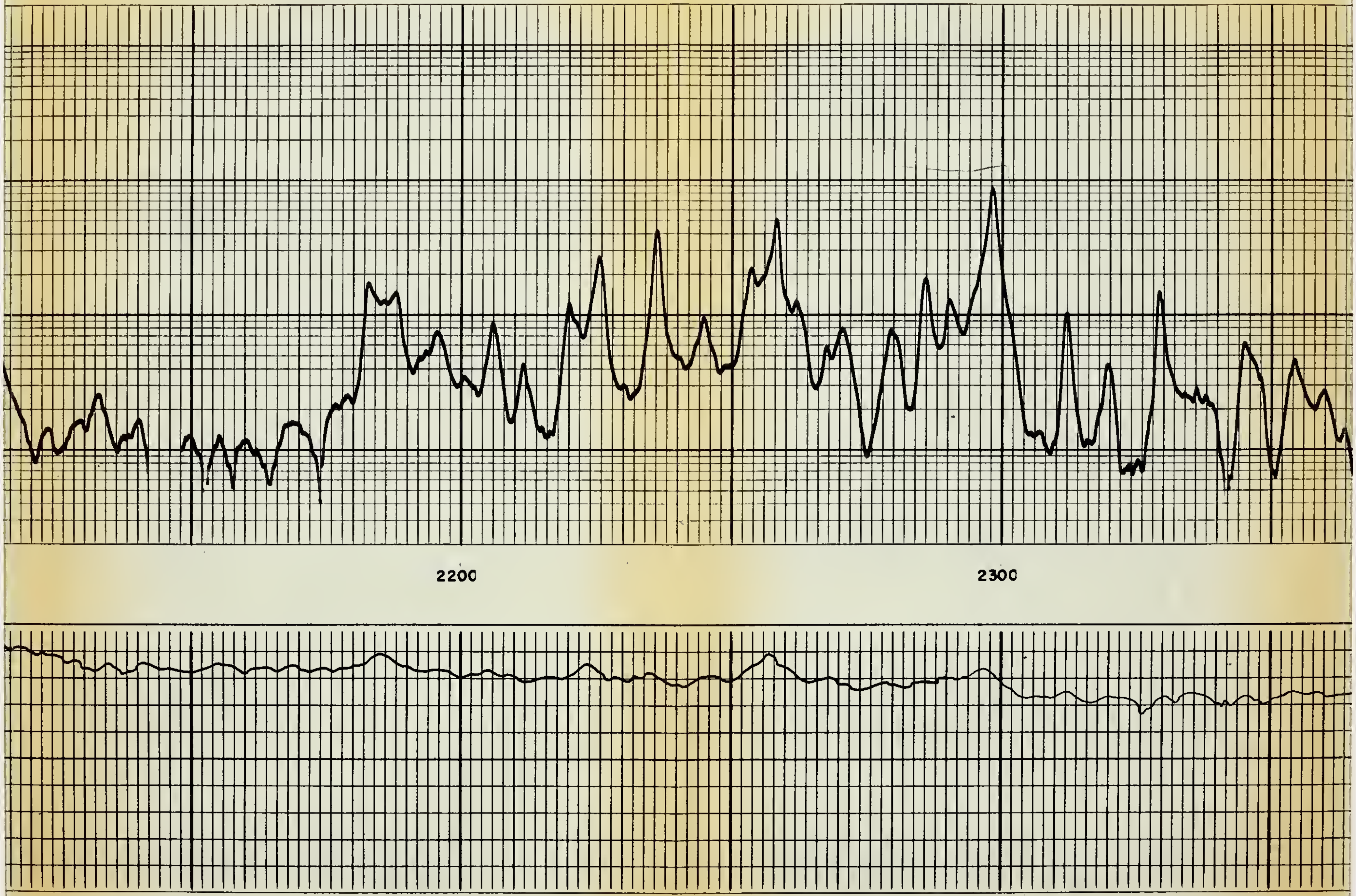
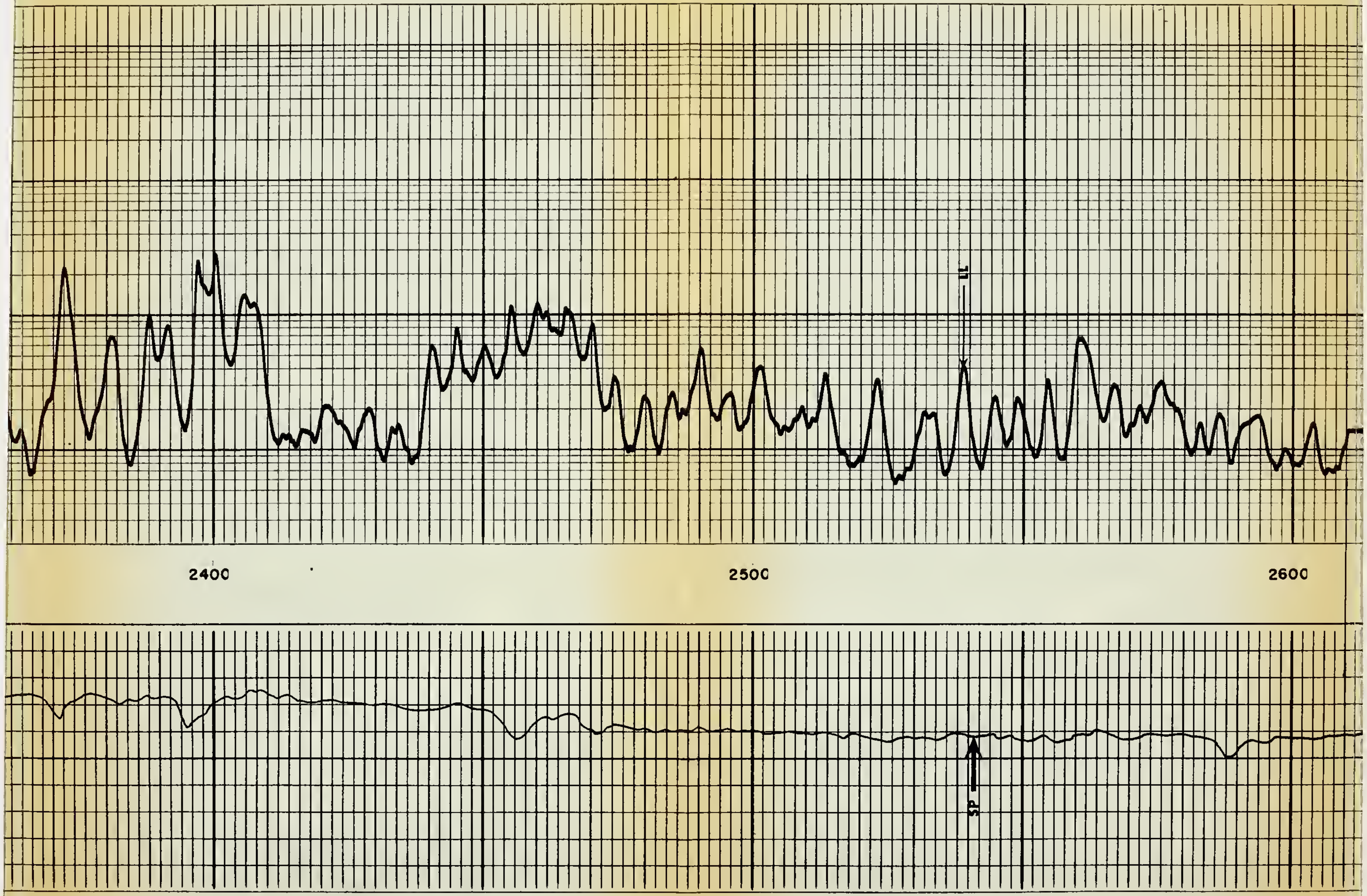
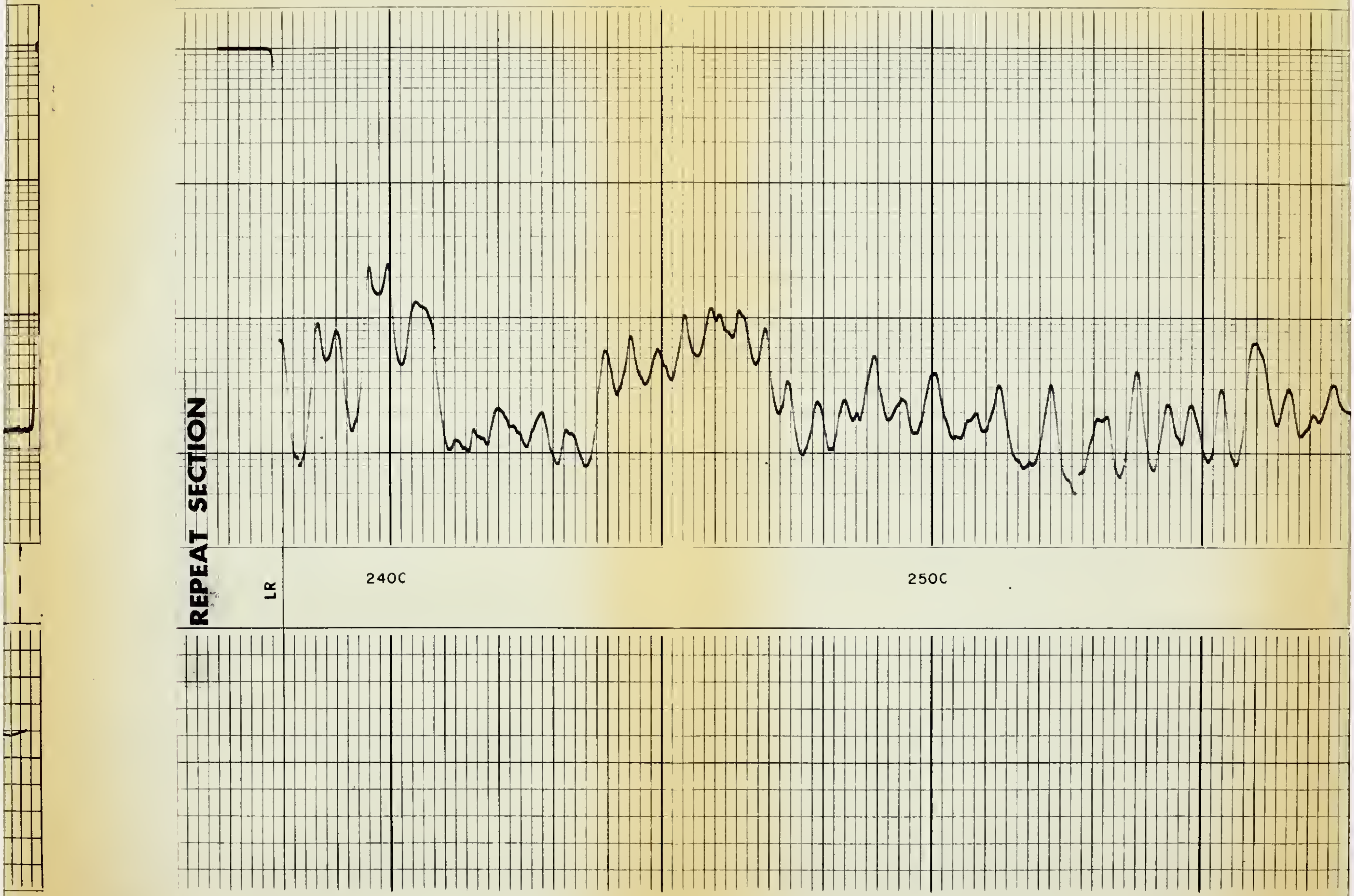
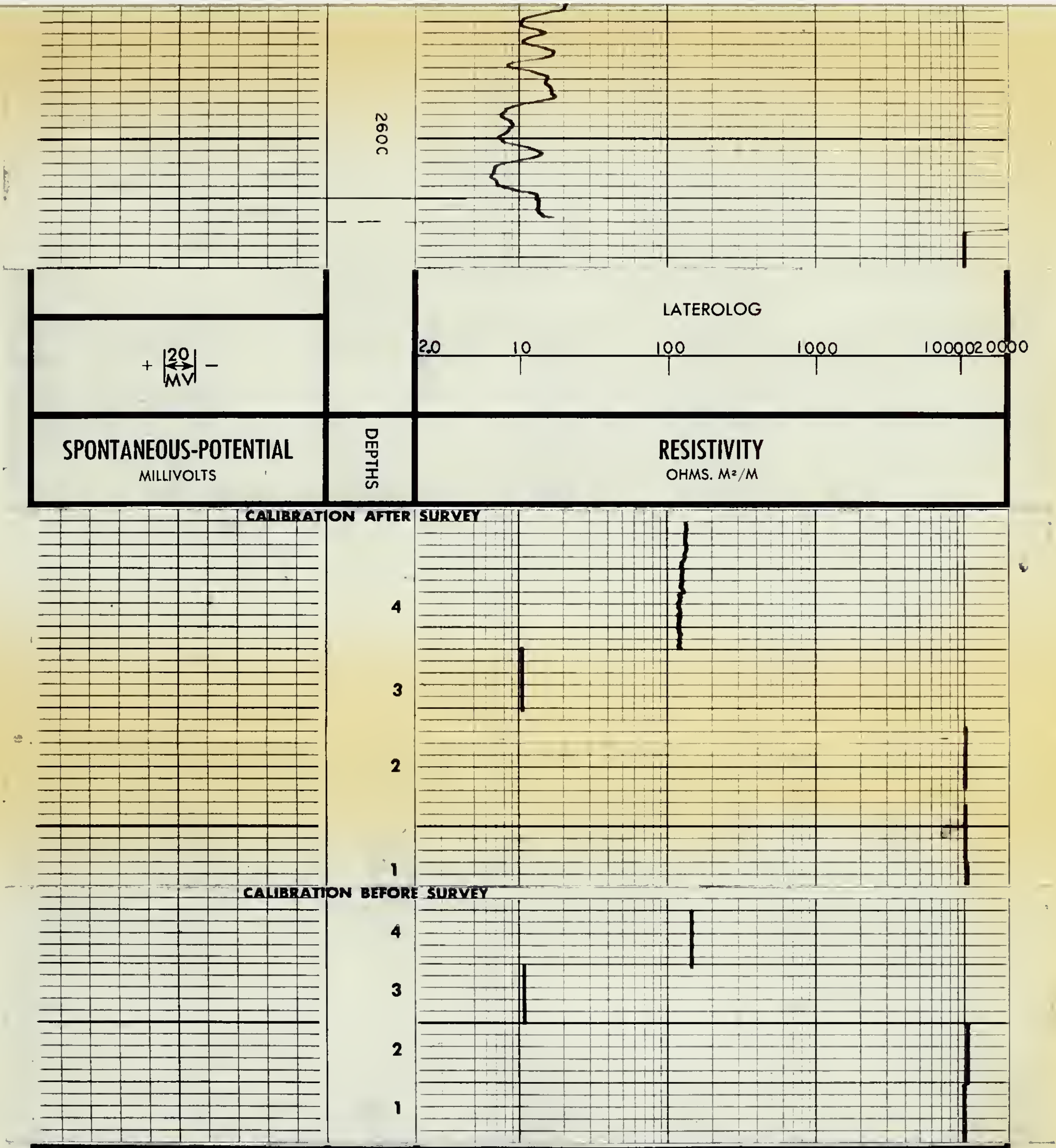

1700
1800


1900
2000
2100


2200
2300


LL
2400
2500
2600
SP


REPEAT SECTION
LR
240C
250C



COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #8
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2610
SCHL. TD 2614
DRLR TD 2608
Elev:
KB ----
DF 6542
GL 6533

SG8b

COREHOLE SG-8

THIS ENVELOPE CONTAINS THE FOLLOWING GEOPHYSICAL LOGS:

1. Schlumberger Formation Density
2. Schlumberger Temperature

II B-2209

SG-8

Schlumberger

TEMPERATURE LOG

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #8
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #8

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION
2600' FWL & 2301' FSL
Sec. 9 Twp. 35S Rge. 96W

Other Services:
BHC-GR
FDC-GR
LL-7
AMP-VDL

Permanent Datum: GL ; Elev.: 6538
Log Measured From GL , 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. 6542
G.L. 6538

Date	11-26-74	11-28-74	
Run No.	ONE	TWO	
Depth—Driller	2608	2608	
Depth—Logger	2610	2603	
Btm. Log Interval	2609	2602	
Top Log Interval	0000	124	
Casing—Driller	8-5/8 @ 176	8-5/8 @ 176	@
Casing—Logger	179	170	
Casing Size 1	To	To	To
2	To	To	To
Casing Weight 1			
2			
Casing Thickness 1			
2			
Bit Size 1	6-1/4 To	6-1/4 To	To
2	To	To	To
Type Fluid in Hole	WATER	WATER	
Dens. | Visc.			
Time Since Circ.	1700 HOURS	5 HOURS	
BHT	134° F	134° F	
Equip. | Location	7674 | VERNAL	7674 | VERNAL	
Recorded By	LANGLEY	ETTER	
Witnessed By	BURNS	BURNS & TAIT	

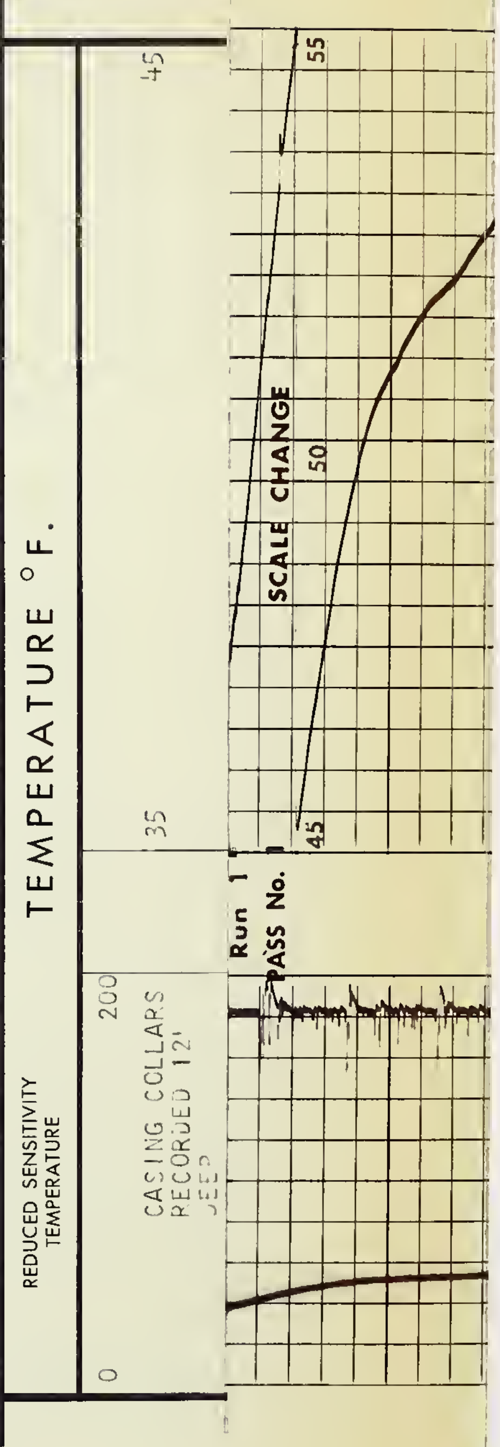
FOLD HERE

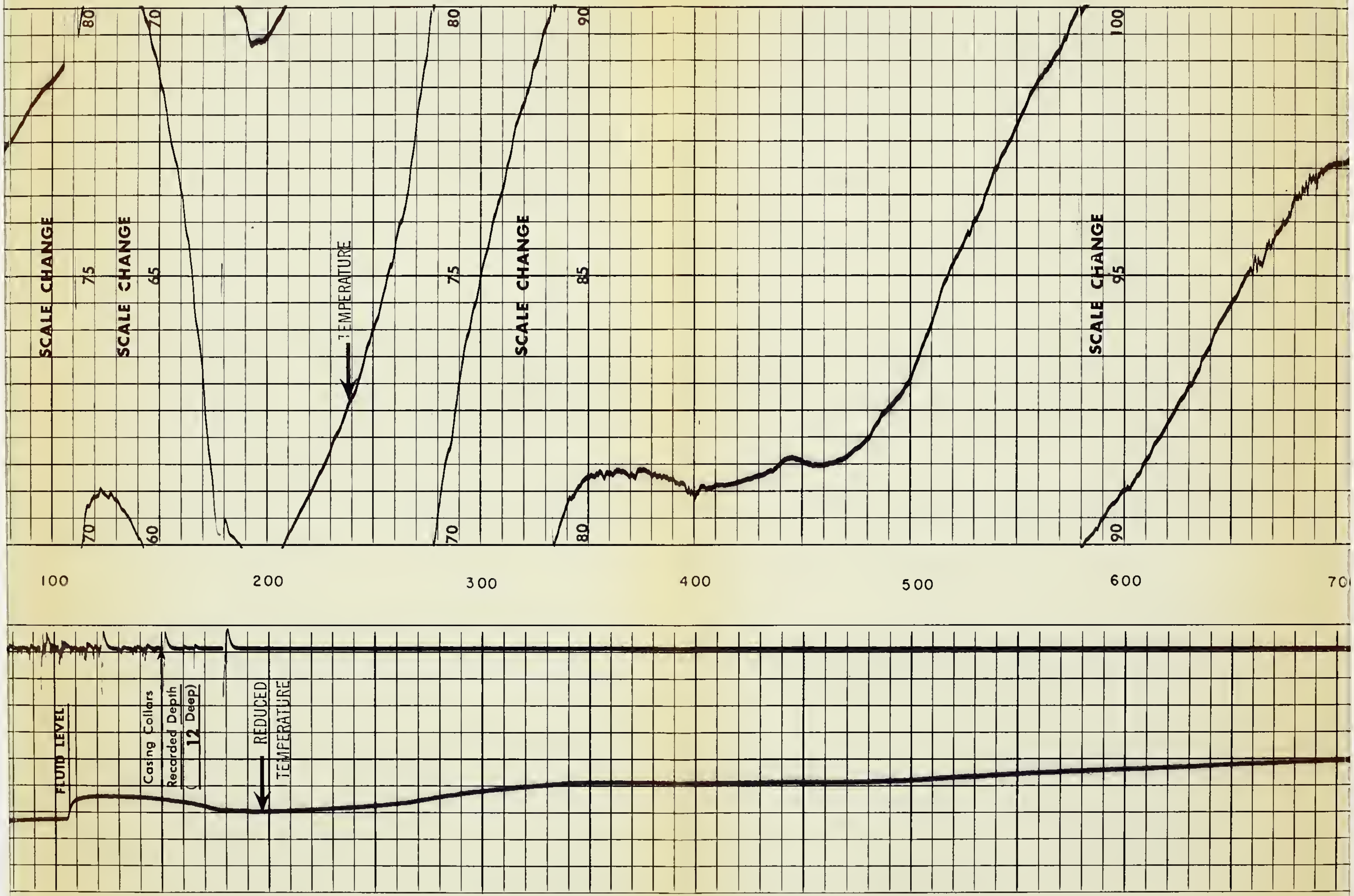
The well name, location and borehole reference data were furnished by the customer.

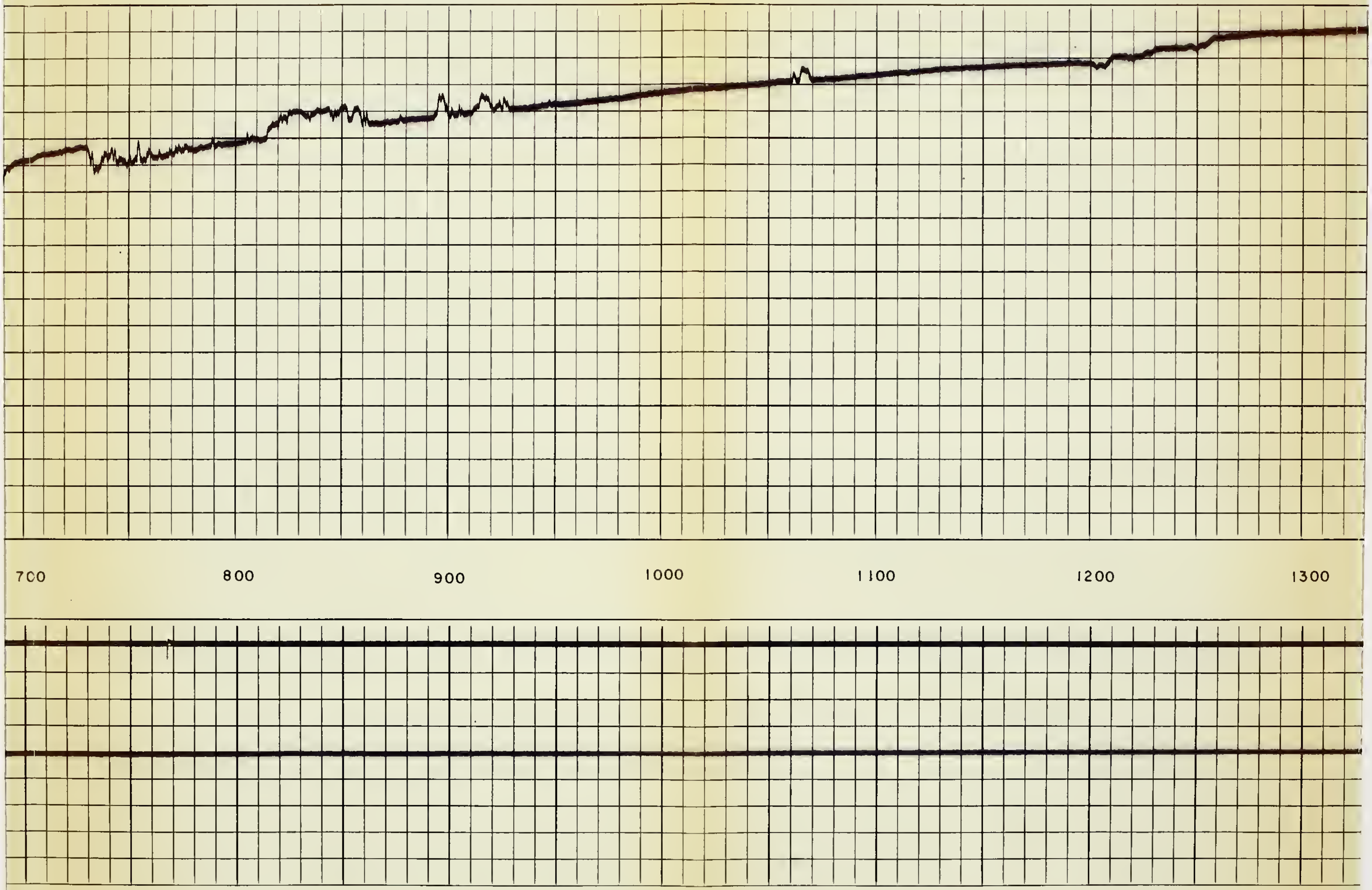
REMARKS: SERVICE ORDER # 28182 RUN ONE-REPEAT OF TOP 1100' OF LOG RUN APPROXIMATELY
2 HOURS AFTER MAIN LOG & HOLE FILLED WITH WATER - 1ST RUN 7:00 P.M. - 2ND RUN 9:00 PM
RUN TWO - ~ 24 HOURS AFTER RUN 1.
LOG ON BOTTOM @2100 HOURS 28TH. --REPEATS RUN AFTER LOG. --COULD NOT GET DOWN
PAST FLOATING MATERIAL @100' FOR MUCH TIME AND EFFORT. --TOOL INDICATED @20° F
BEFORE GETTING WET AND HAVING TROUBLE GETTING DOWN.
EQUIPMENT: PPU 748; CEC 771; CCE 773; MTS 774 - BOTH RUNS

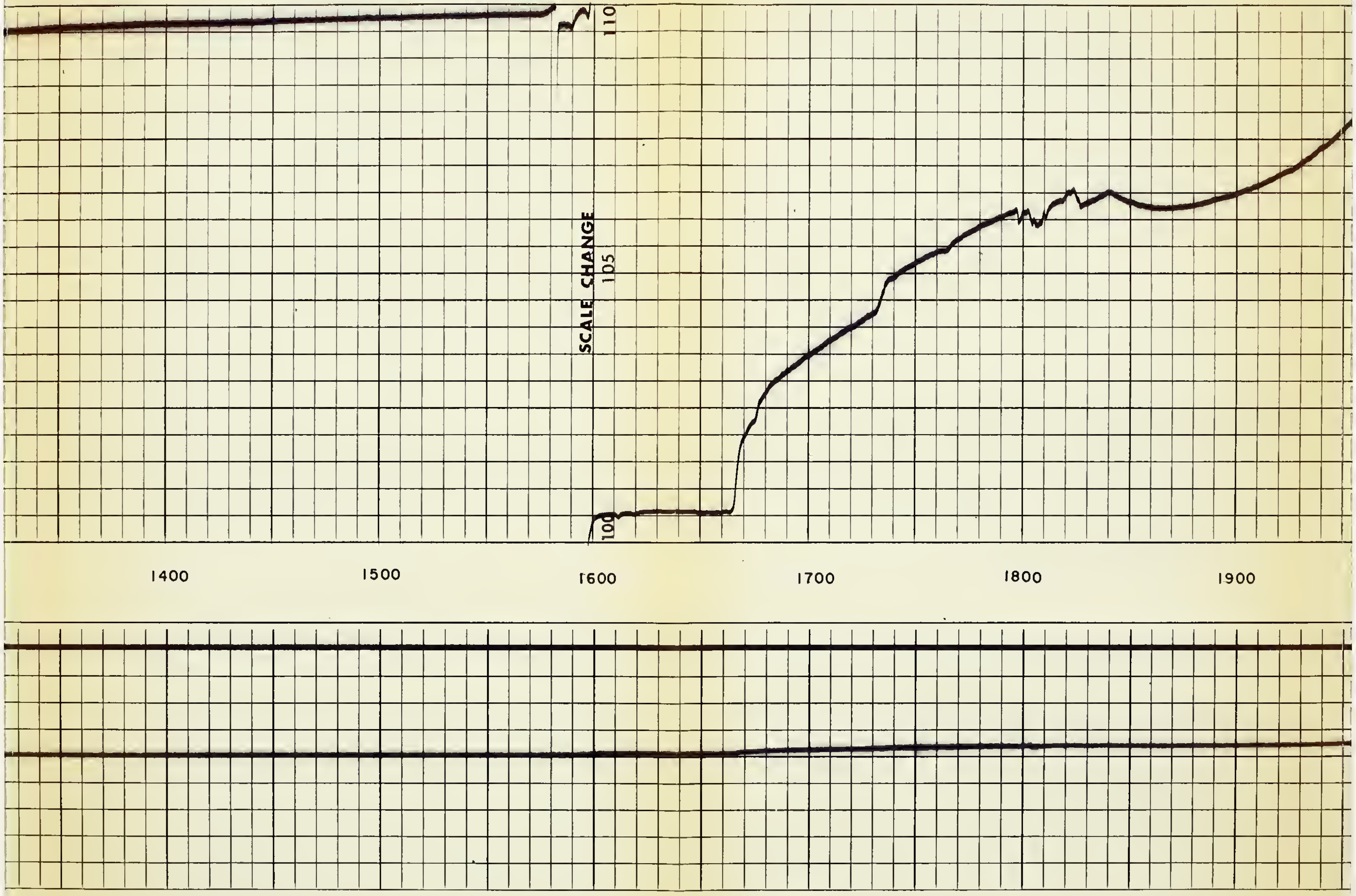
CEMENTATION DATA

Date	Depth	Type of Cement	Nb of Sacks	Additives	Calculated Top

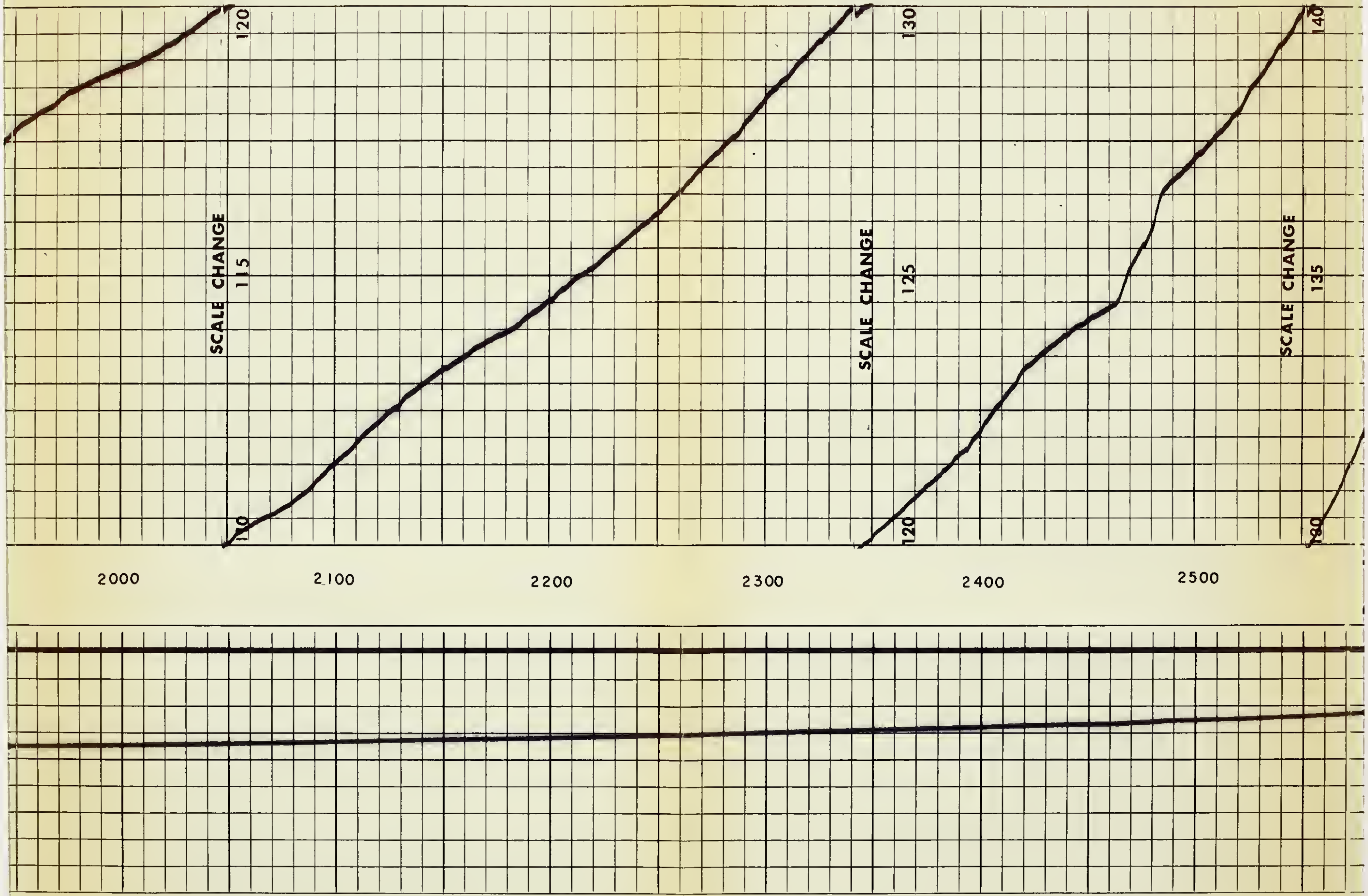


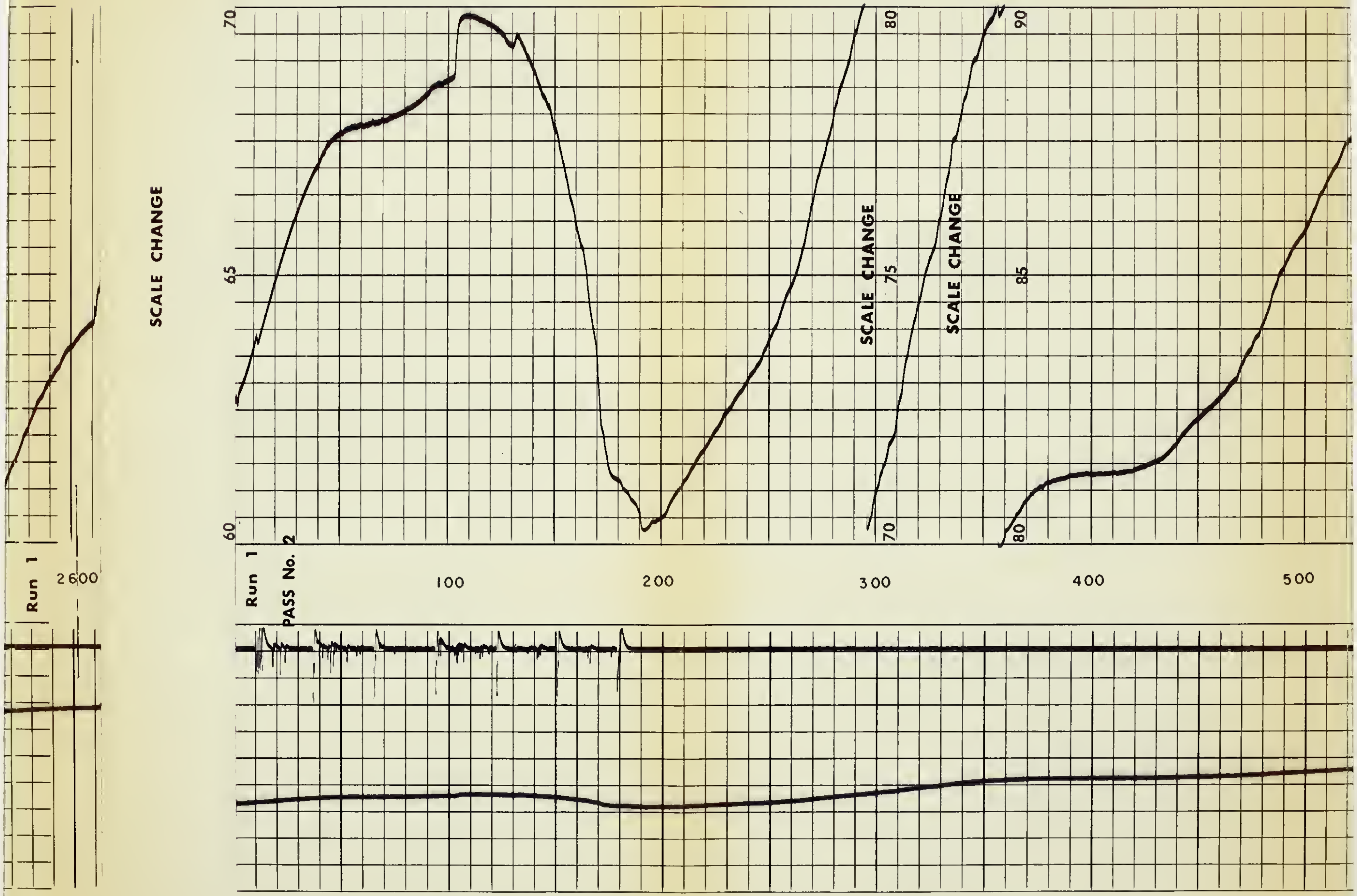

SCALE CHANGE
75
80
SCALE CHANGE
65
70
70
60
TEMPERATURE
75
80
70
SCALE CHANGE
85
90
80
SCALE CHANGE
95
100
90
100
200
300
400
500
600
70
FLUID LEVEL
Casing Collars
Recorded Depth
(12 Deep)
REDUCED TEMPERATURE

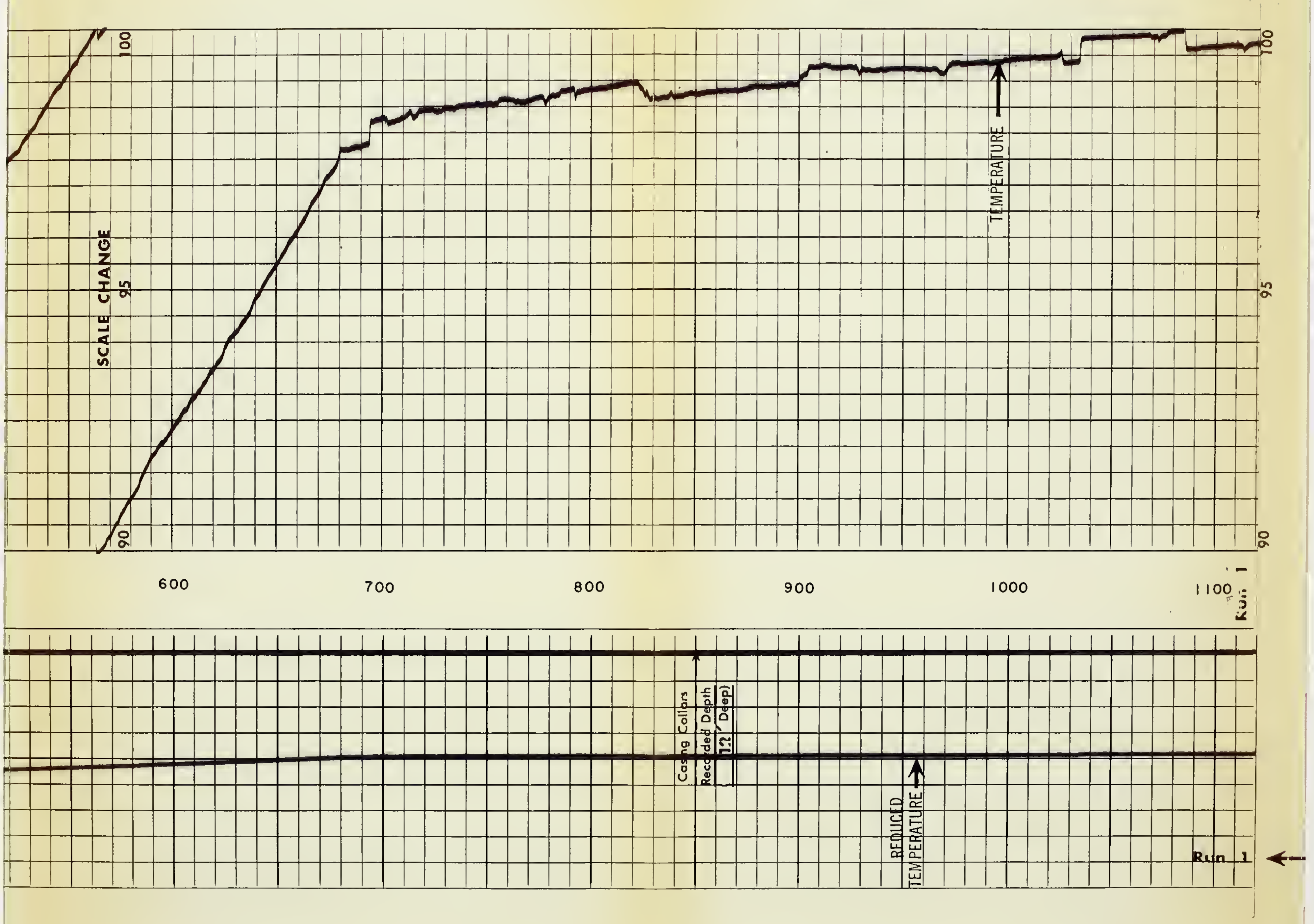

700
800
900
1000
1100
1200
1300

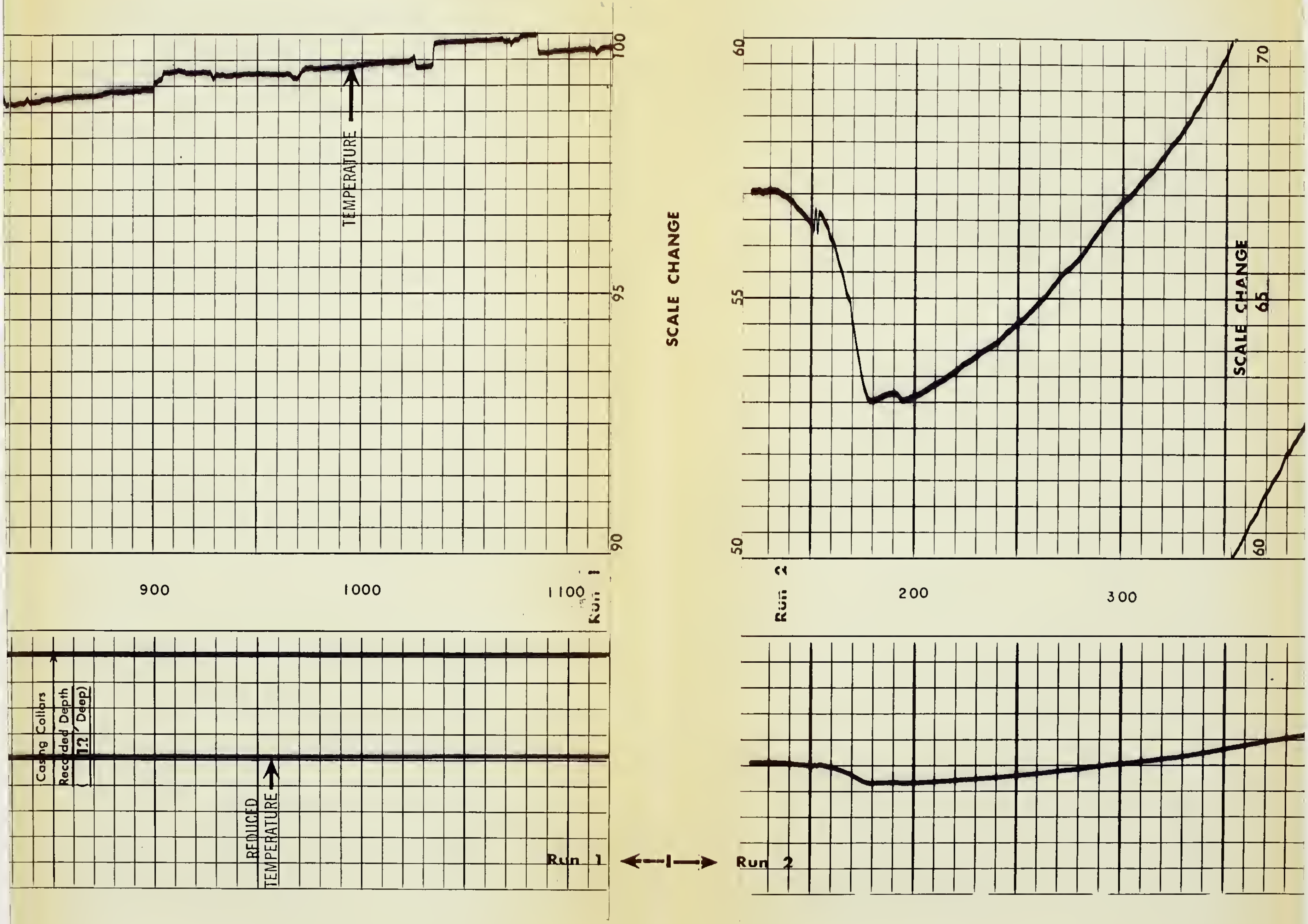


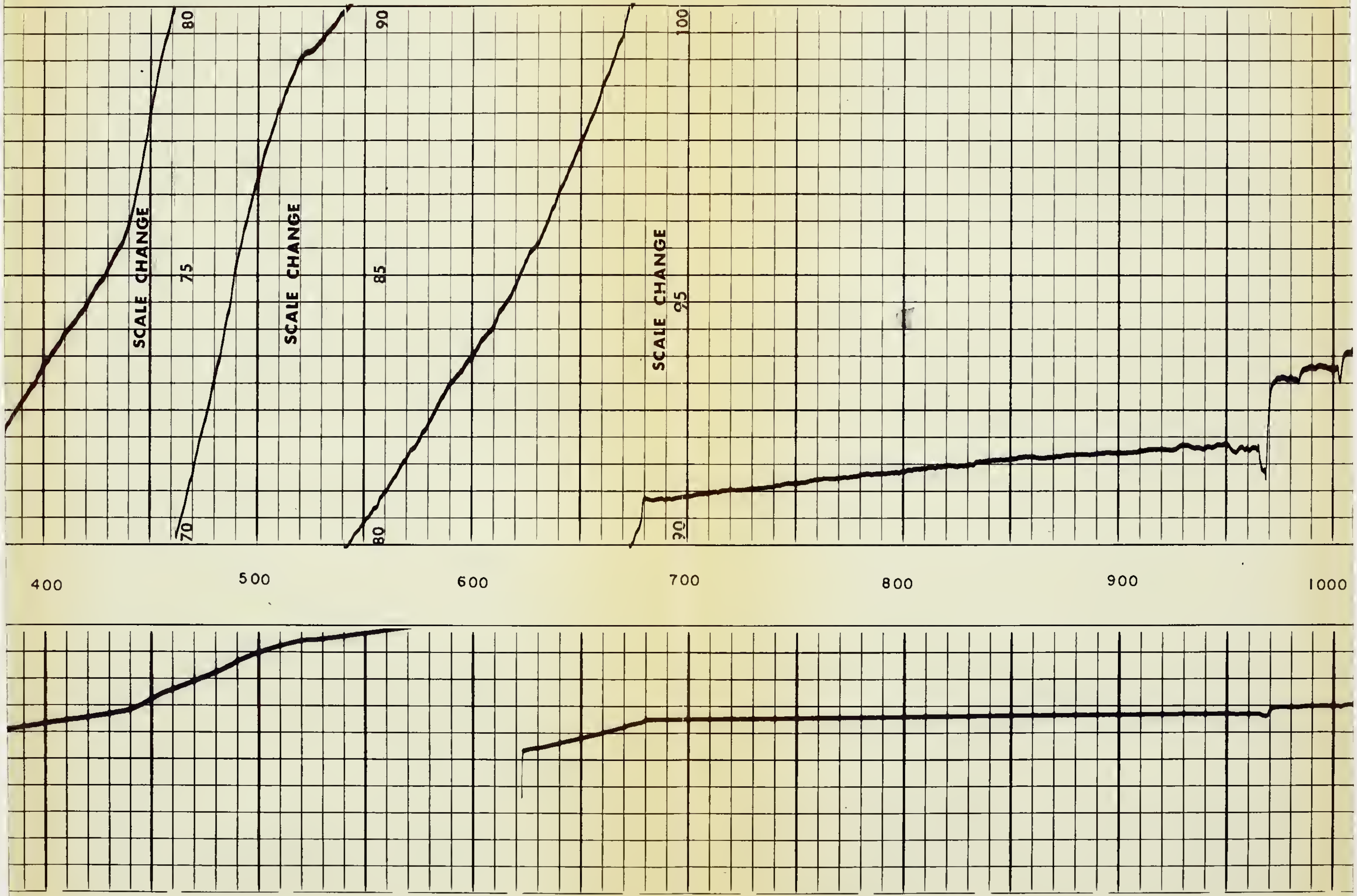
110
SCALE CHANGE
105
100
1400
1500
1600
1700
1800
1900


120
SCALE CHANGE
115
110
130
SCALE CHANGE
125
120
140
SCALE CHANGE
135
130
2000
2100
2200
2300
2400
2500


Run 1
2600
SCALE CHANGE
70
65
60
Run 1
PASS No. 2
100
200
SCALE CHANGE
80
75
70
300
SCALE CHANGE
90
85
80
400
500


SCALE CHANGE
100
95
90
TEMPERATURE
100
95
90
600
700
800
900
1000
1100
Run 1
Casing Collars
Recorded Depth
(12' Deep)
REDUCED TEMPERATURE
Run 1


100
95
90
TEMPERATURE
SCALE CHANGE
60
55
50
70
SCALE CHANGE
65
60
900
1000
1100
Run 1
Run 2
200
300
Casing Collars
Recorded Depth
(12' Deep)
REDUCED TEMPERATURE
Run 1
I
Run 2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90
100
SCALE CHANGE
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SCALE CHANGE
85
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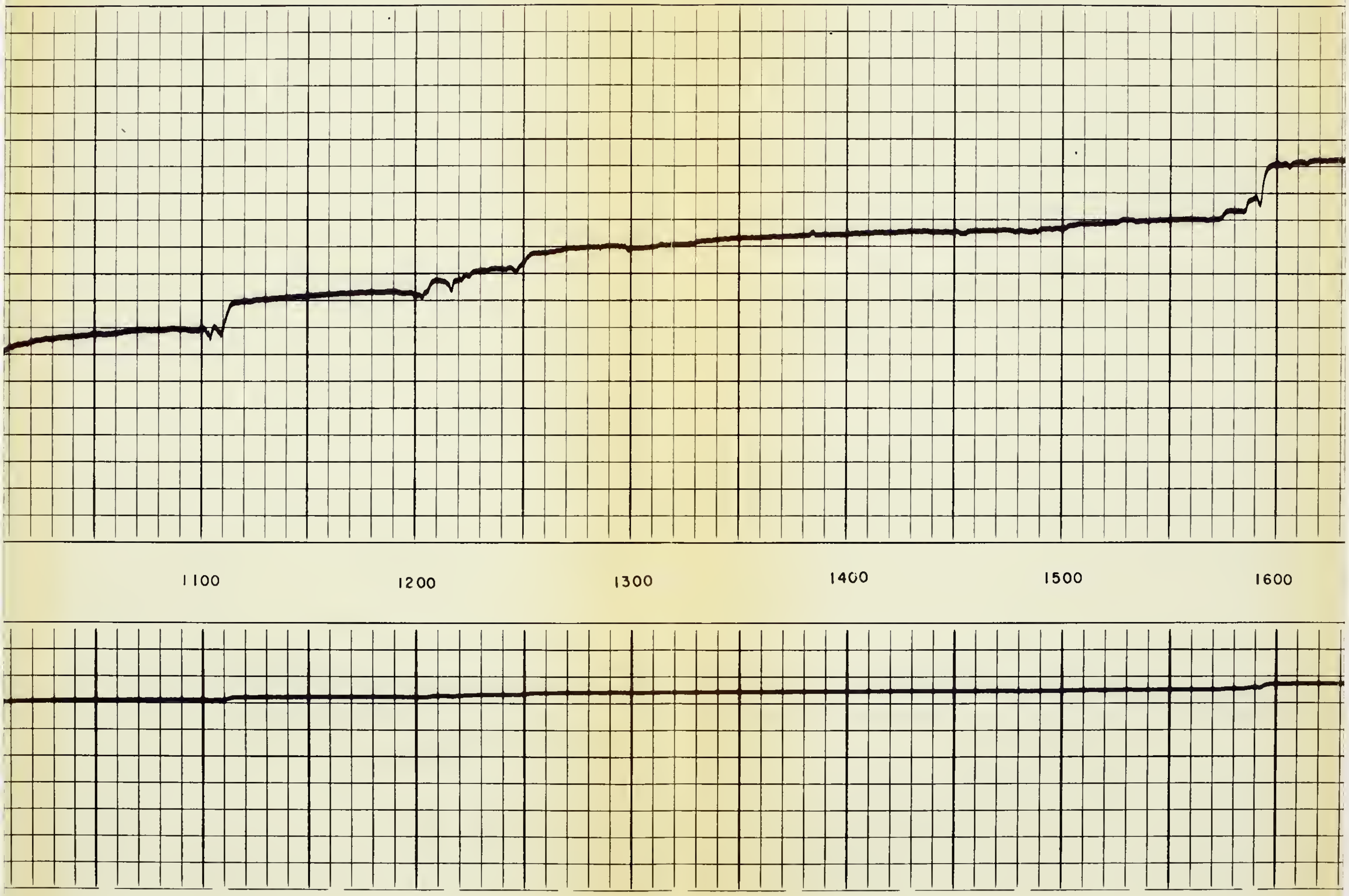
900
1000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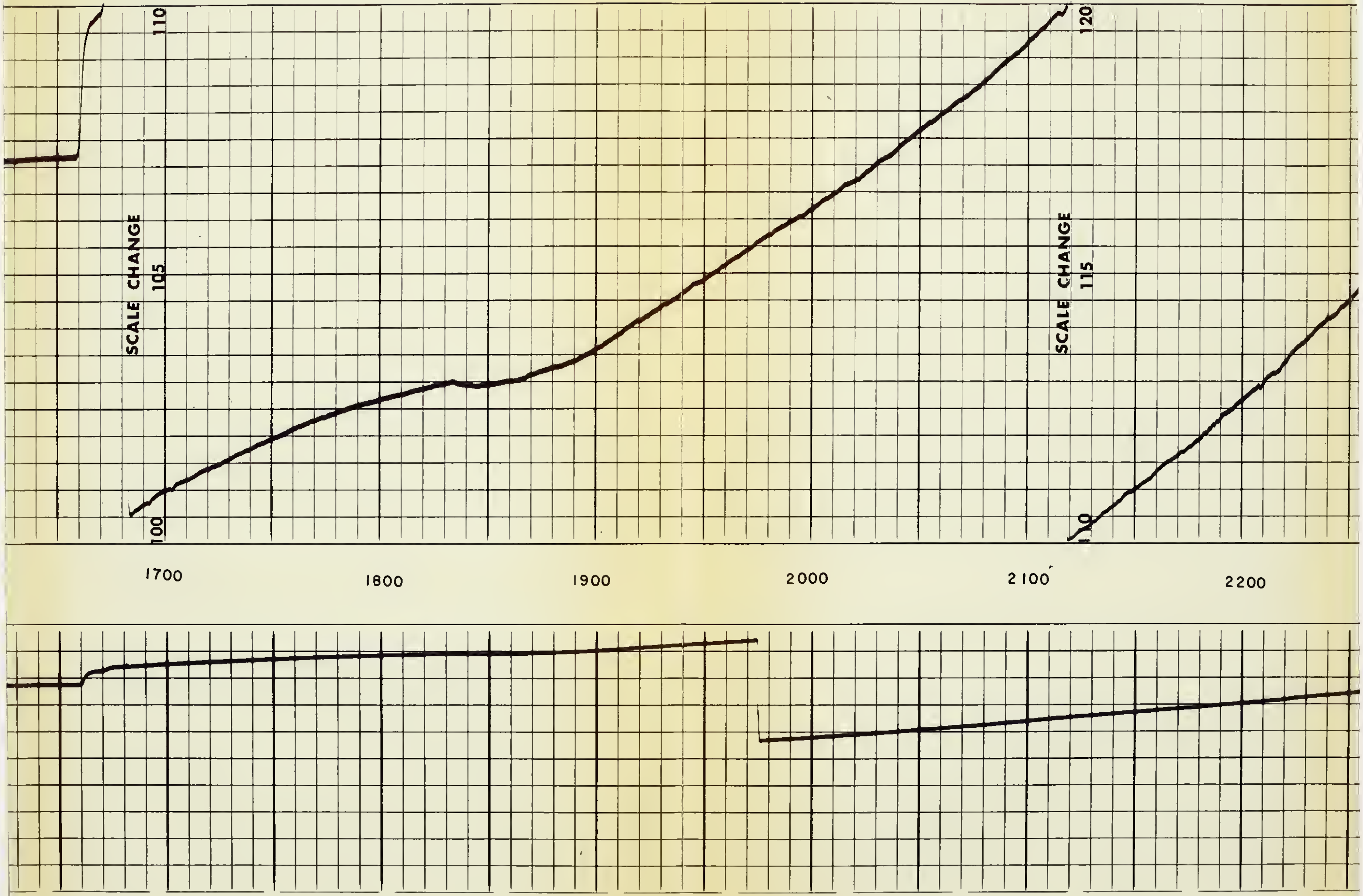

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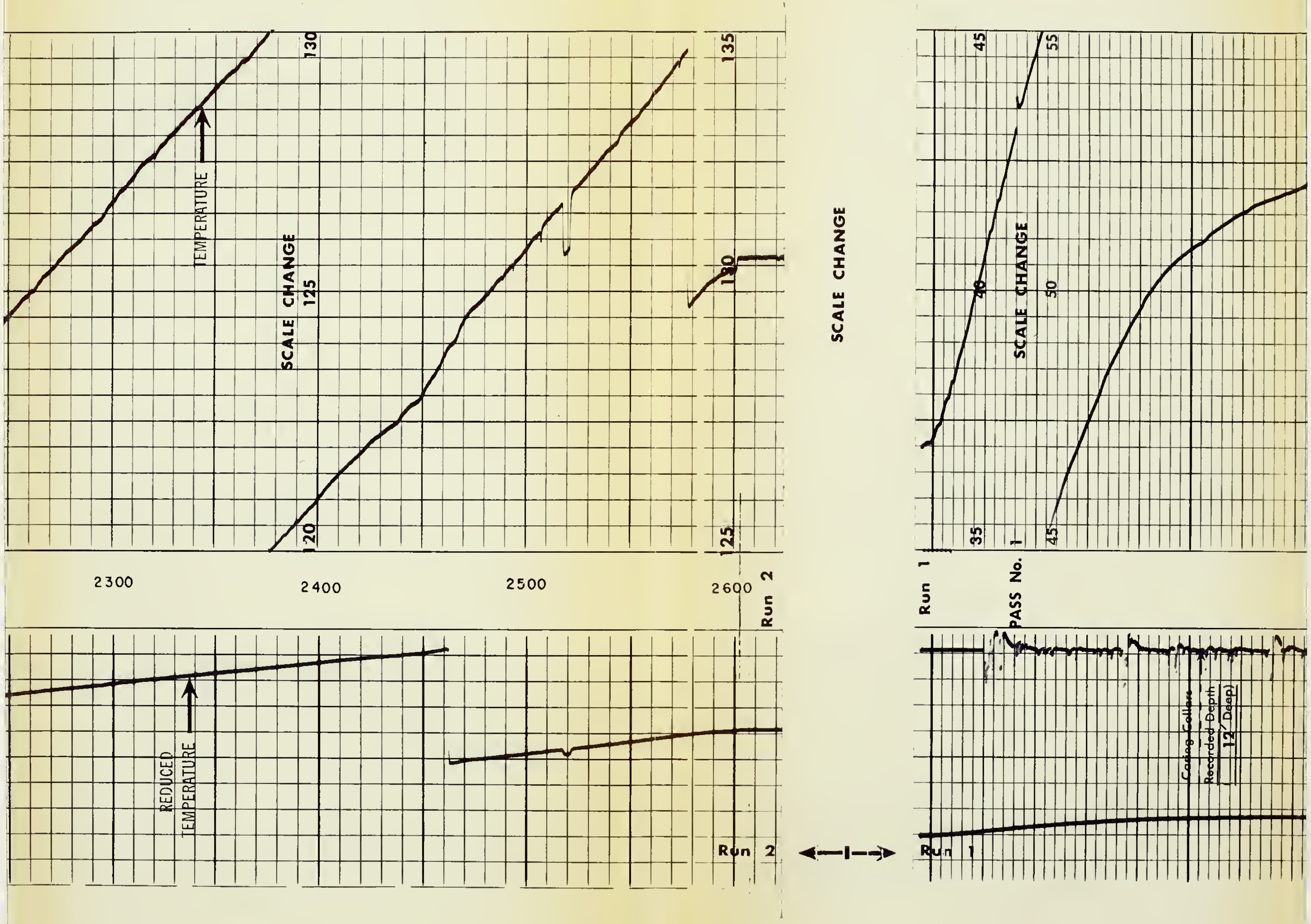
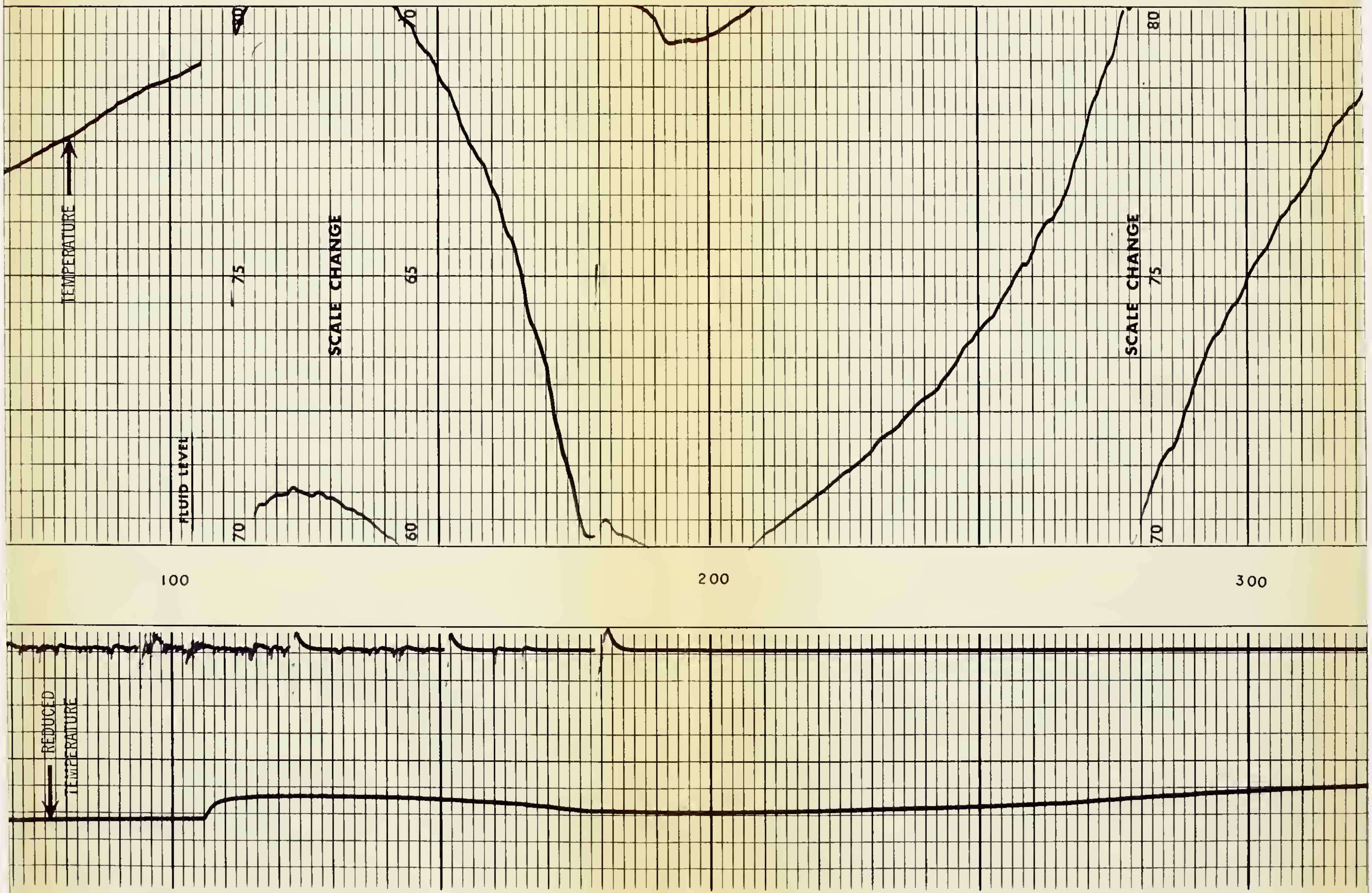
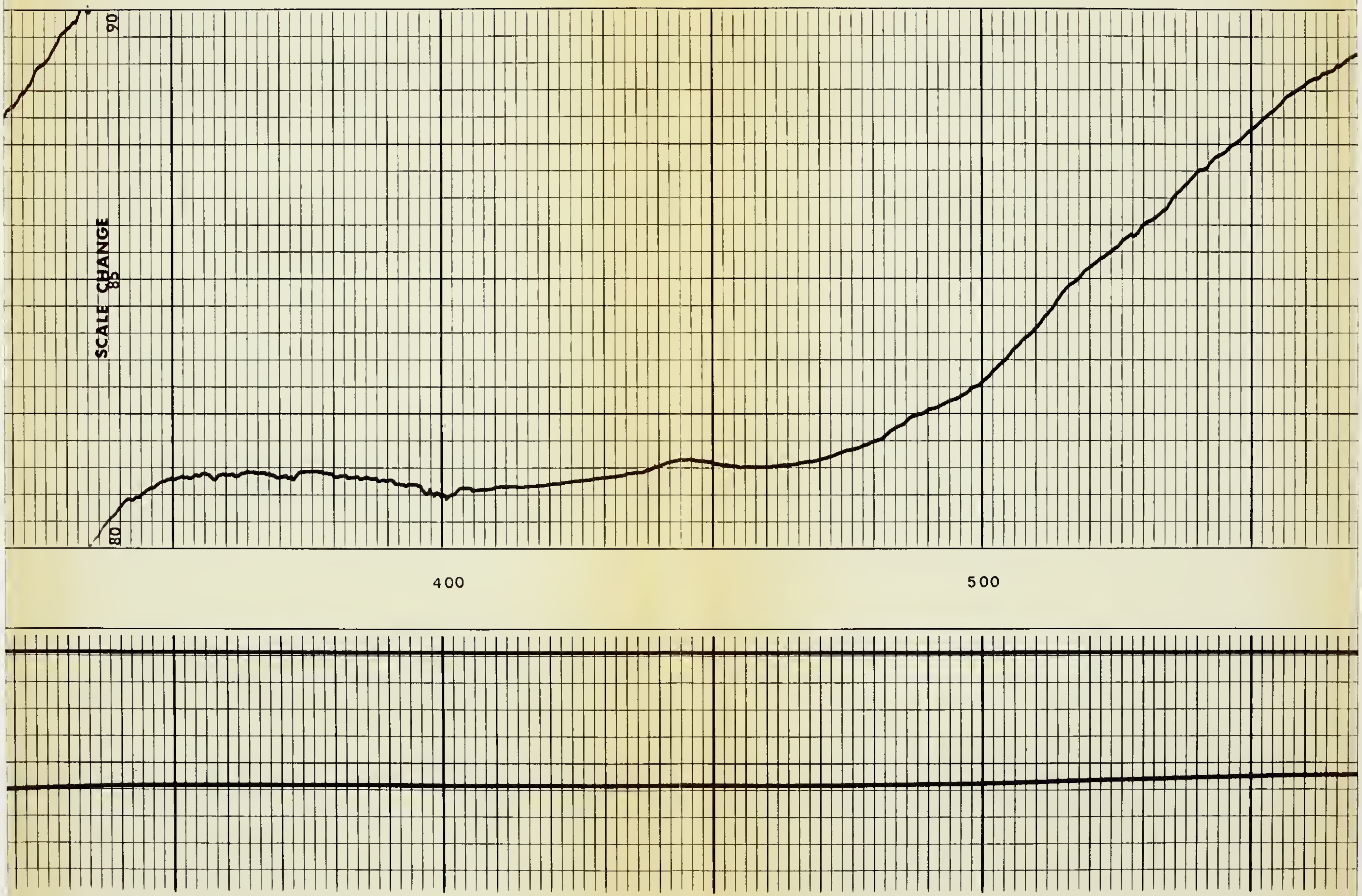
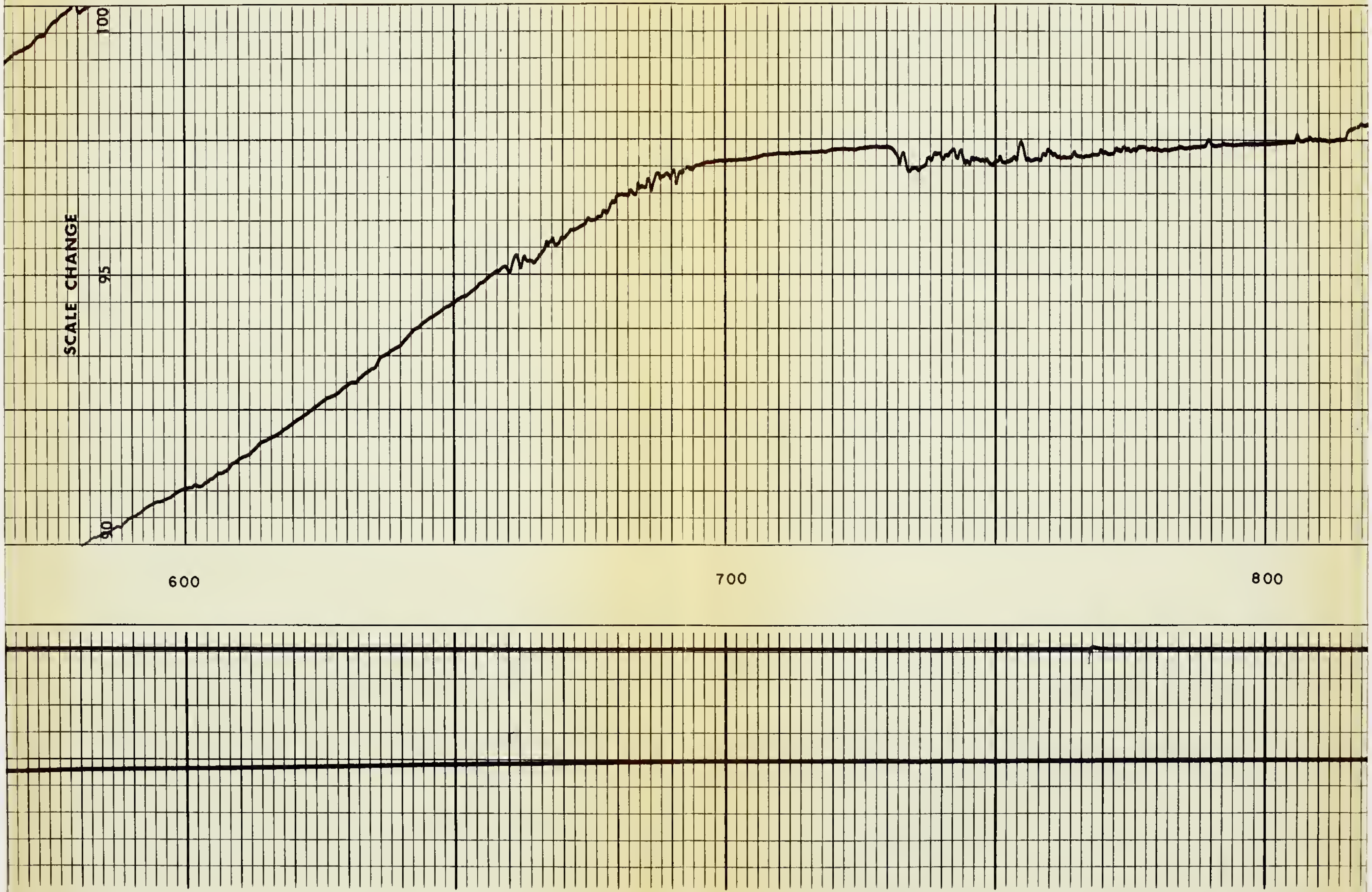
SCALE CHANGE
105
100
120
SCALE CHANGE
115
110
1700
1800
1900
2000
2100
2200


TEMPERATURE
SCALE CHANGE
120
125
130
125
130
135
2300
2400
2500
2600
Run 2
REDUCED TEMPERATURE
Run 2
SCALE CHANGE
35
40
45
SCALE CHANGE
45
50
55
Run 1
PASS No. 1
Casing Collars
Recorded Depth
(12' Deep)
Run 1


TEMPERATURE
FLUID LEVEL
80
75
70
SCALE CHANGE
70
65
60
80
SCALE CHANGE
75
70
100
200
300
REDUCED TEMPERATURE


90
SCALE CHANGE
85
80
400
500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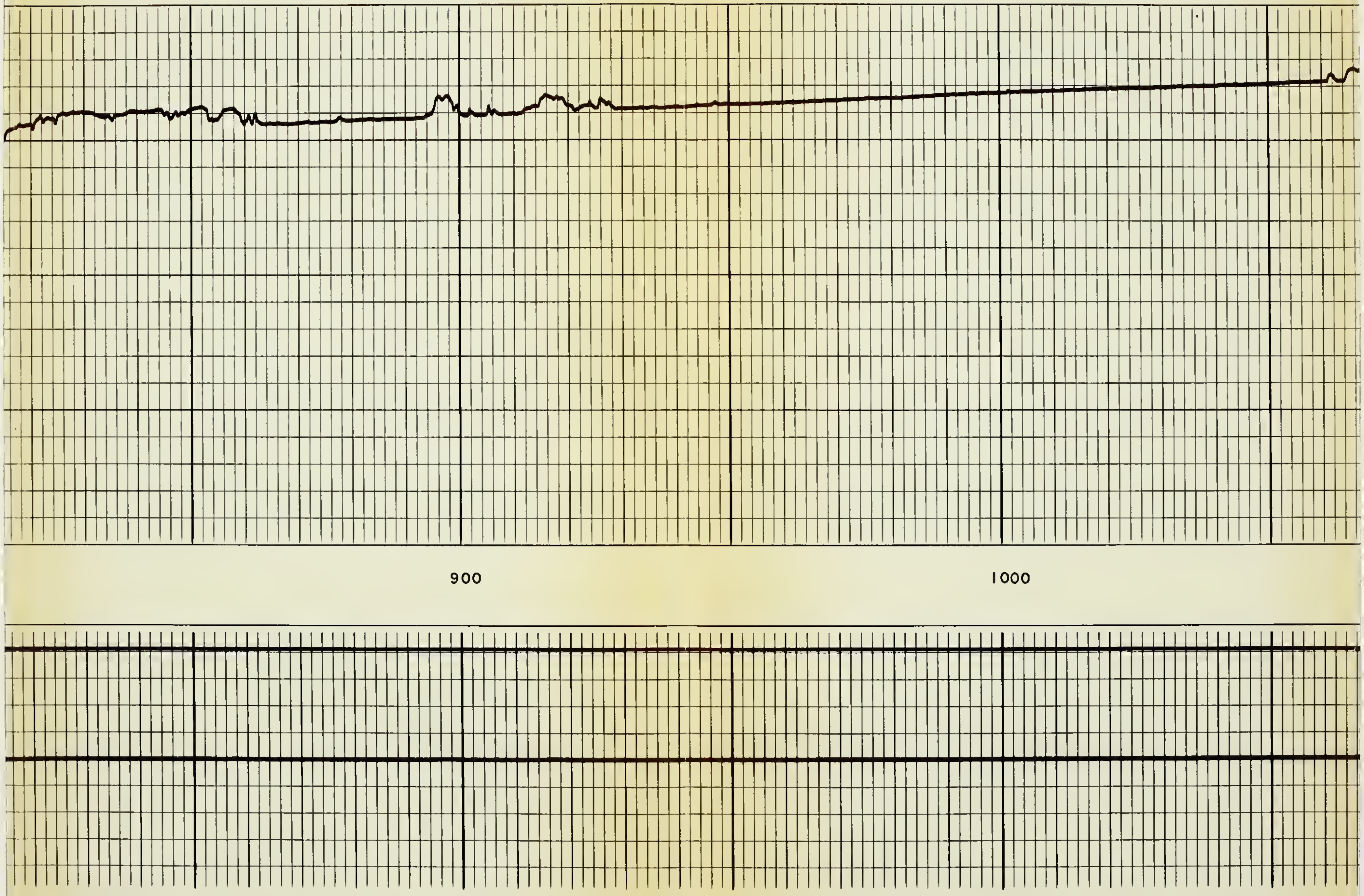
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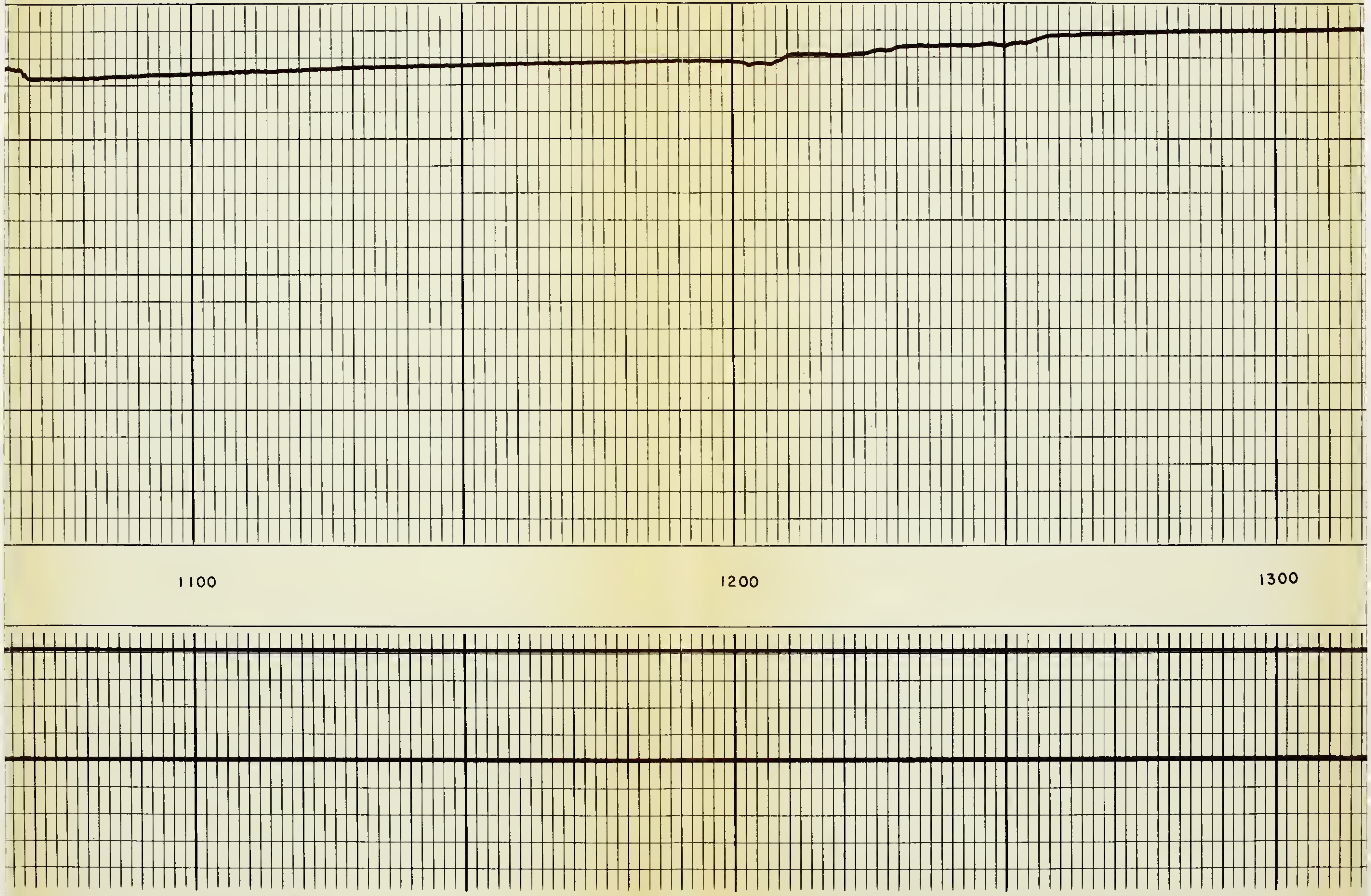
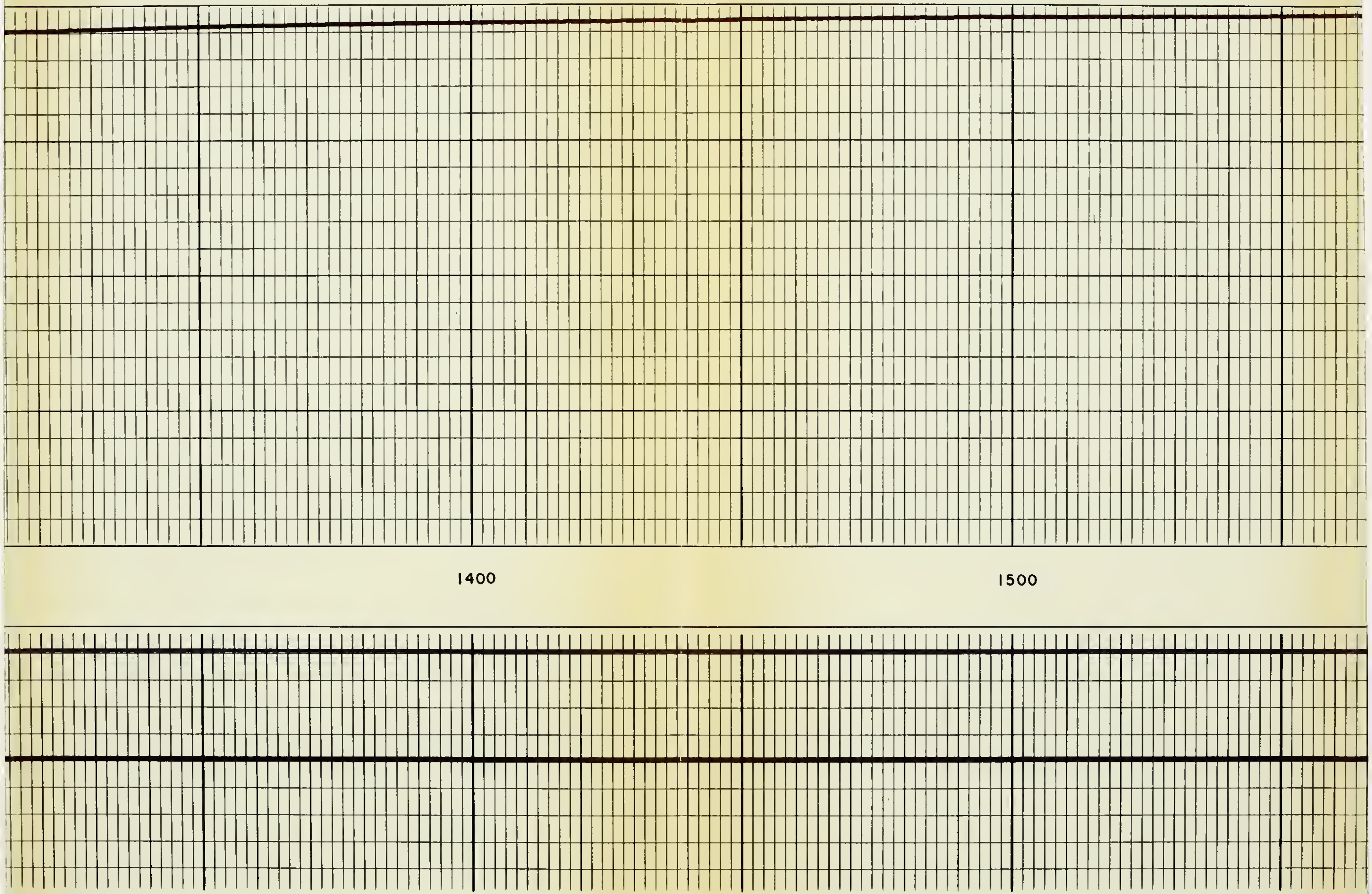
1000


1100
1200
1300


1400
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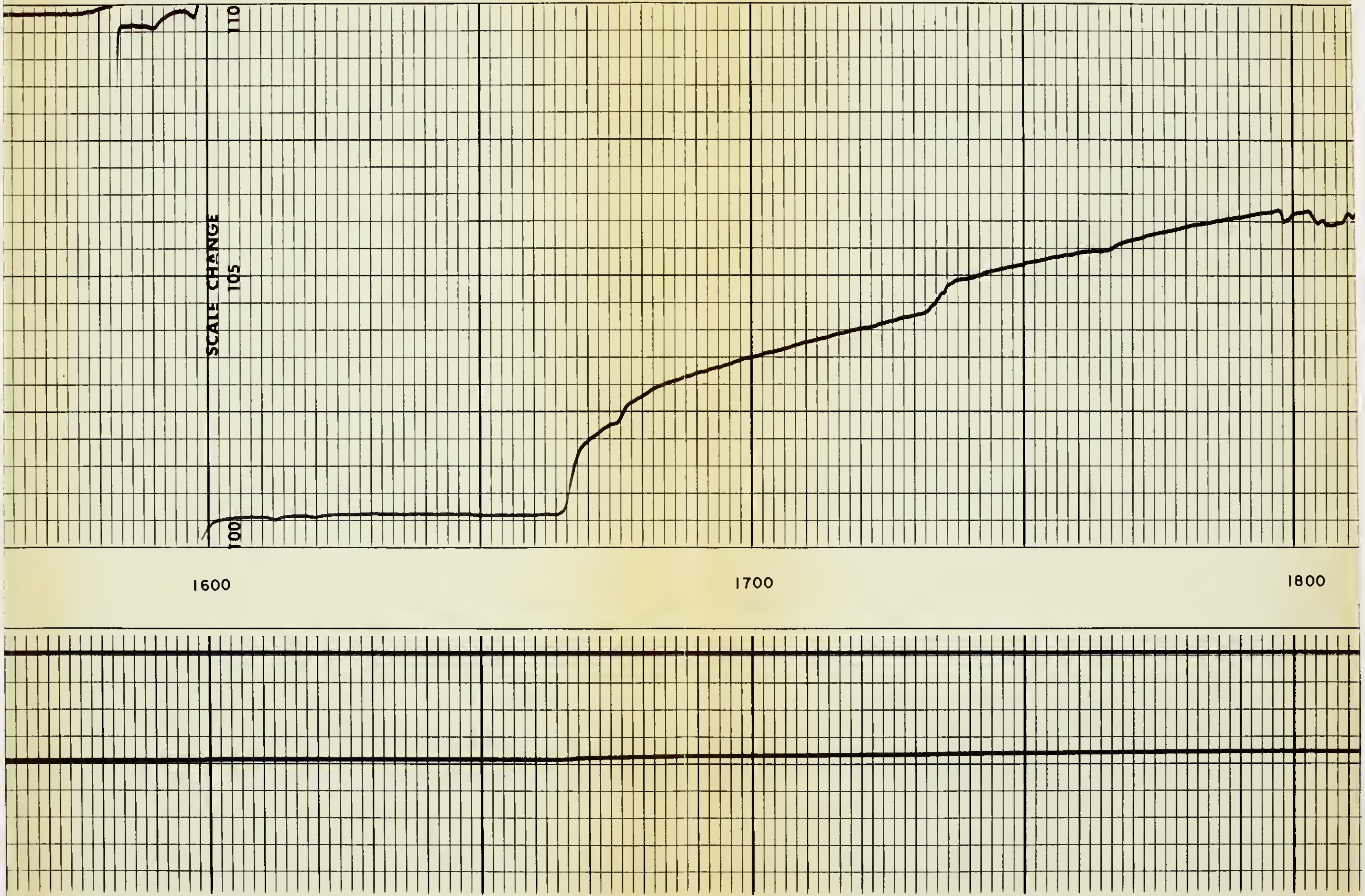
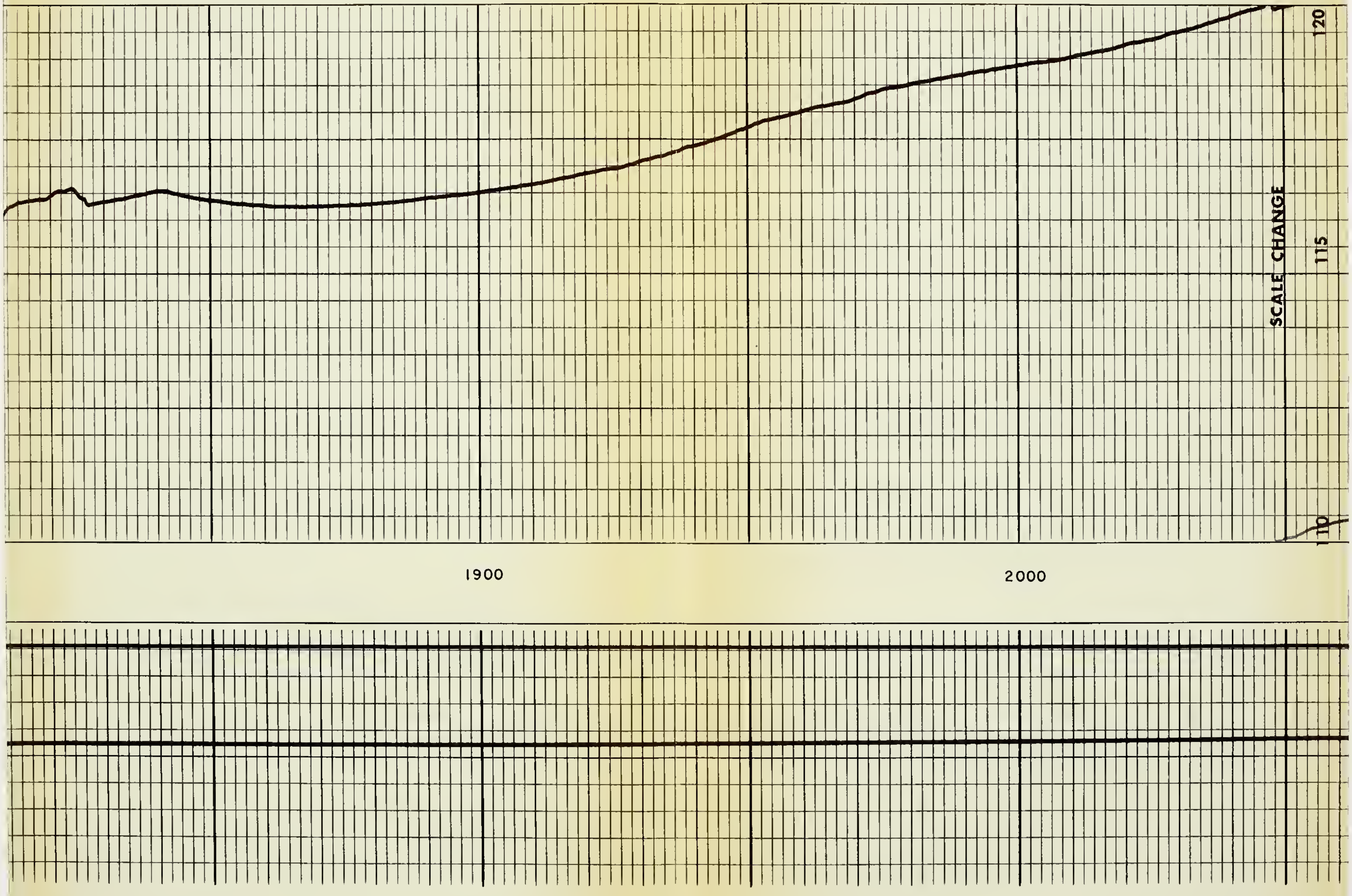
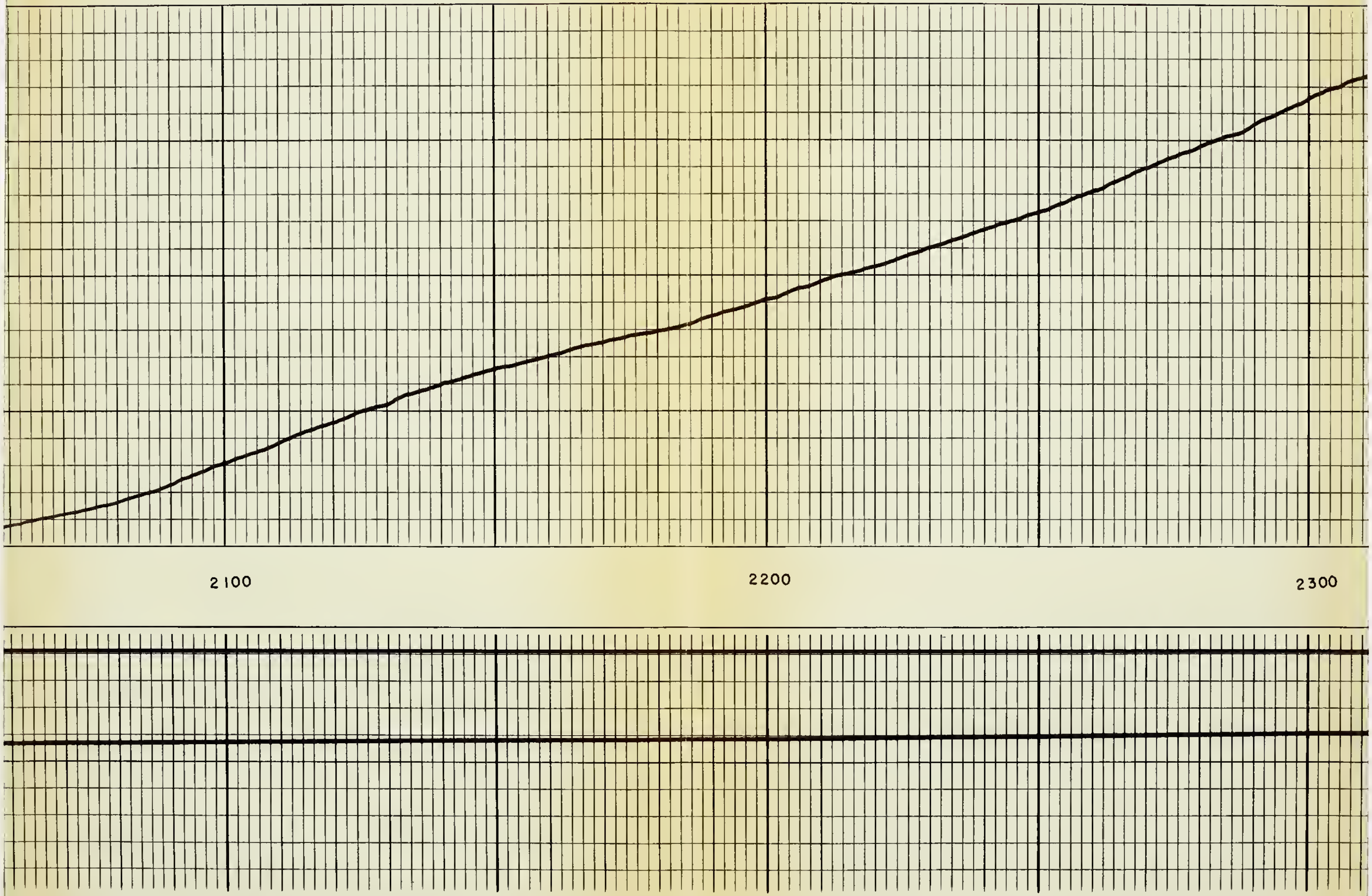
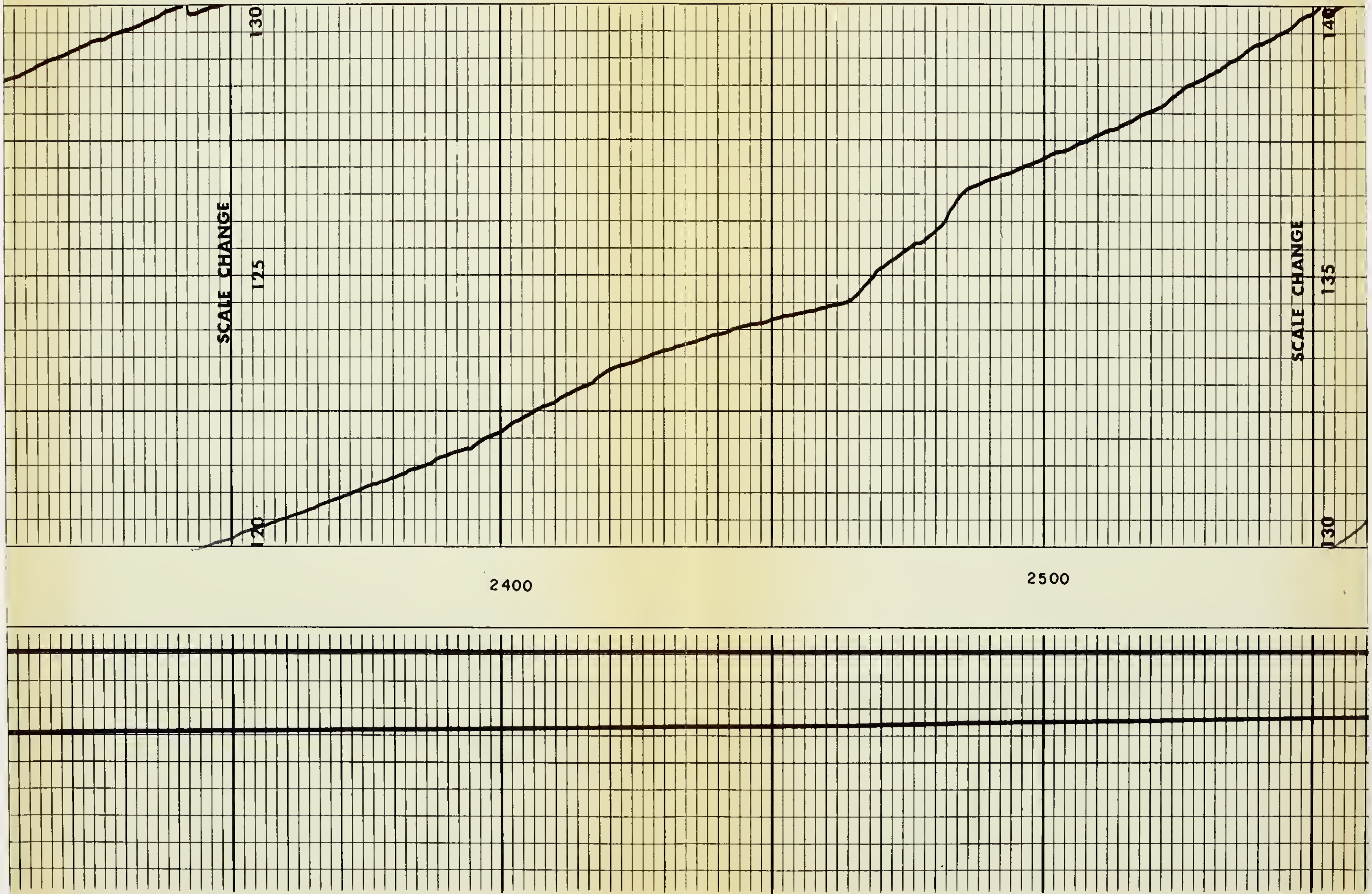
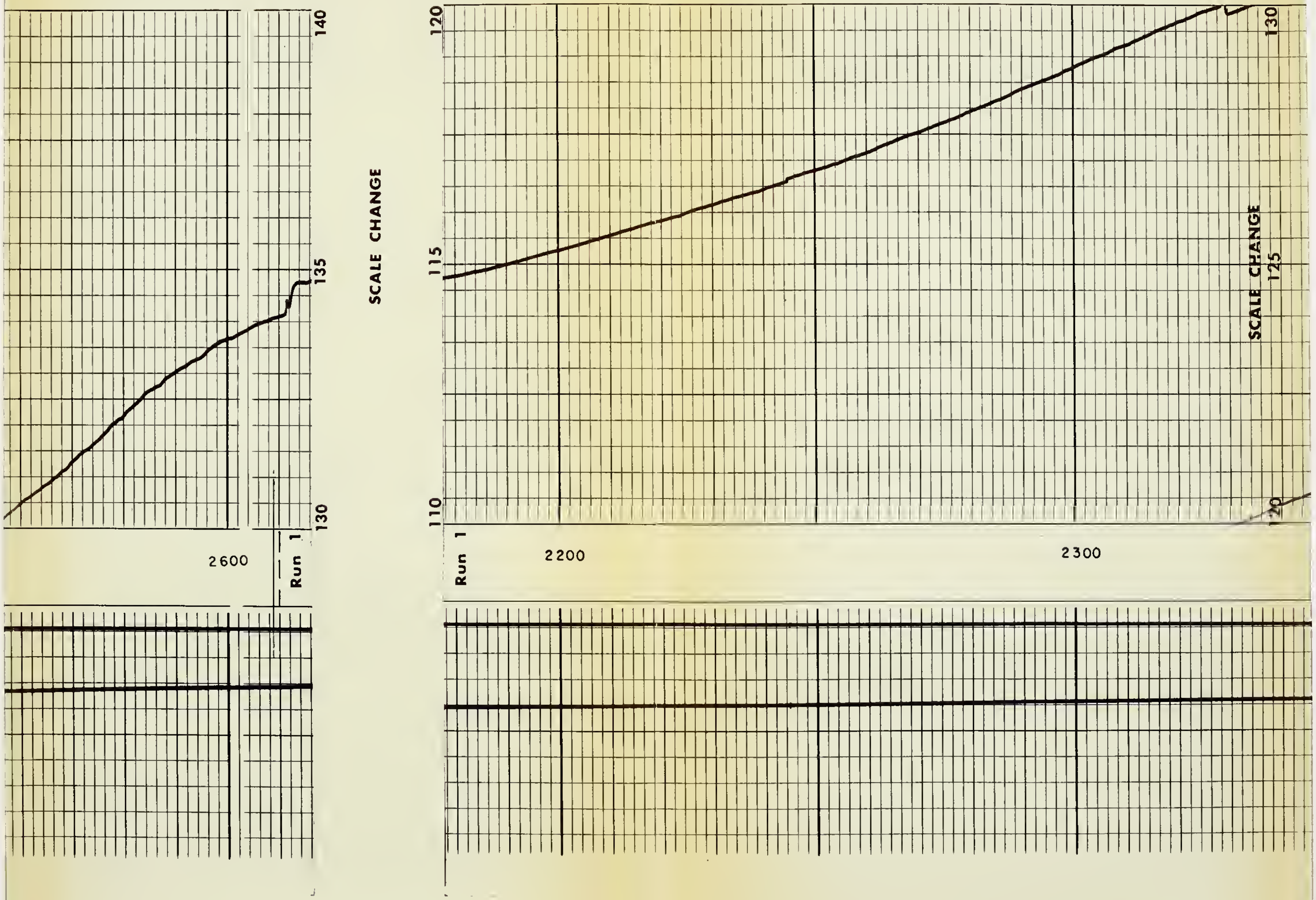
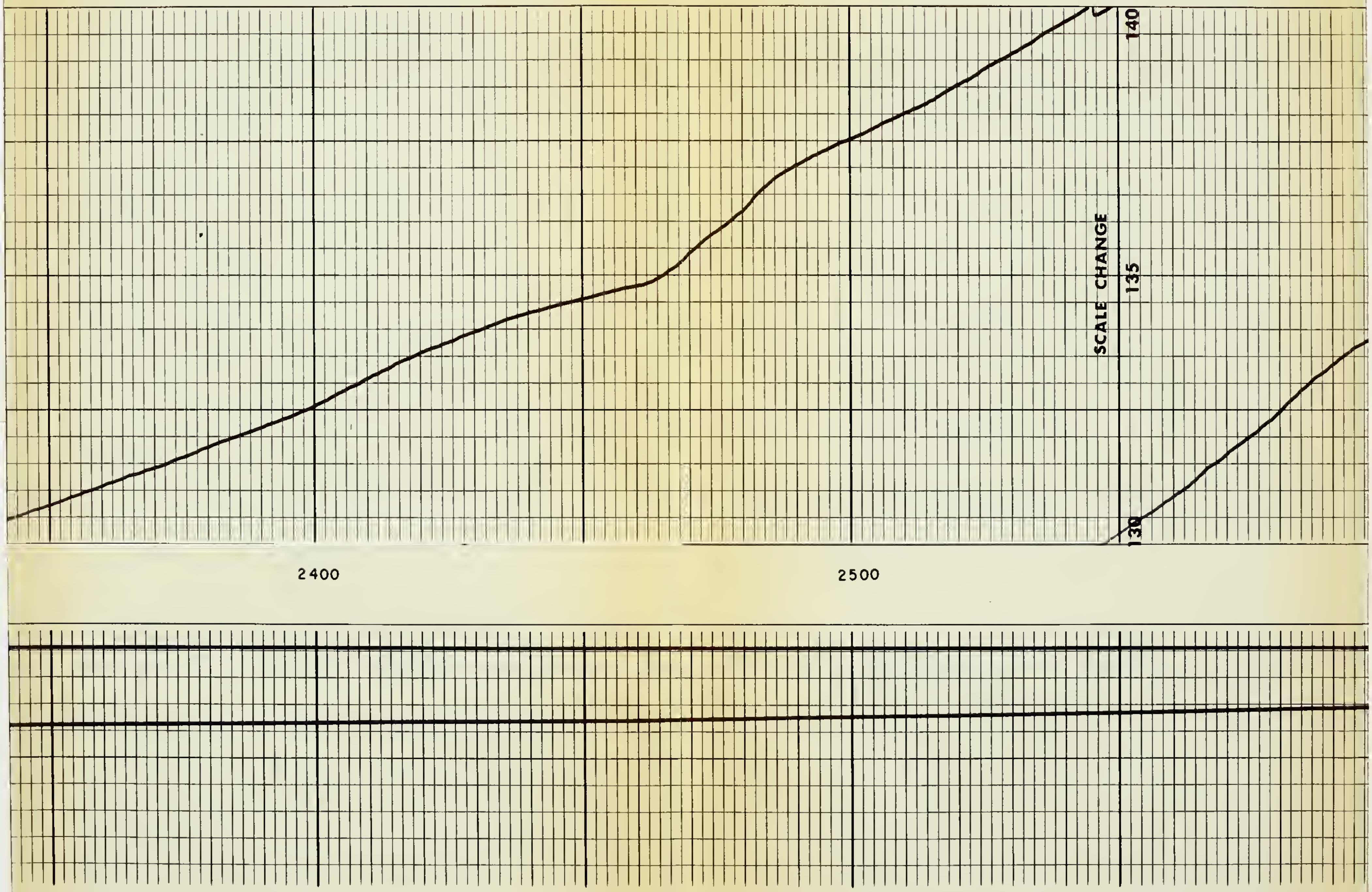

110
SCALE CHANGE
105
100
1600
1700
1800

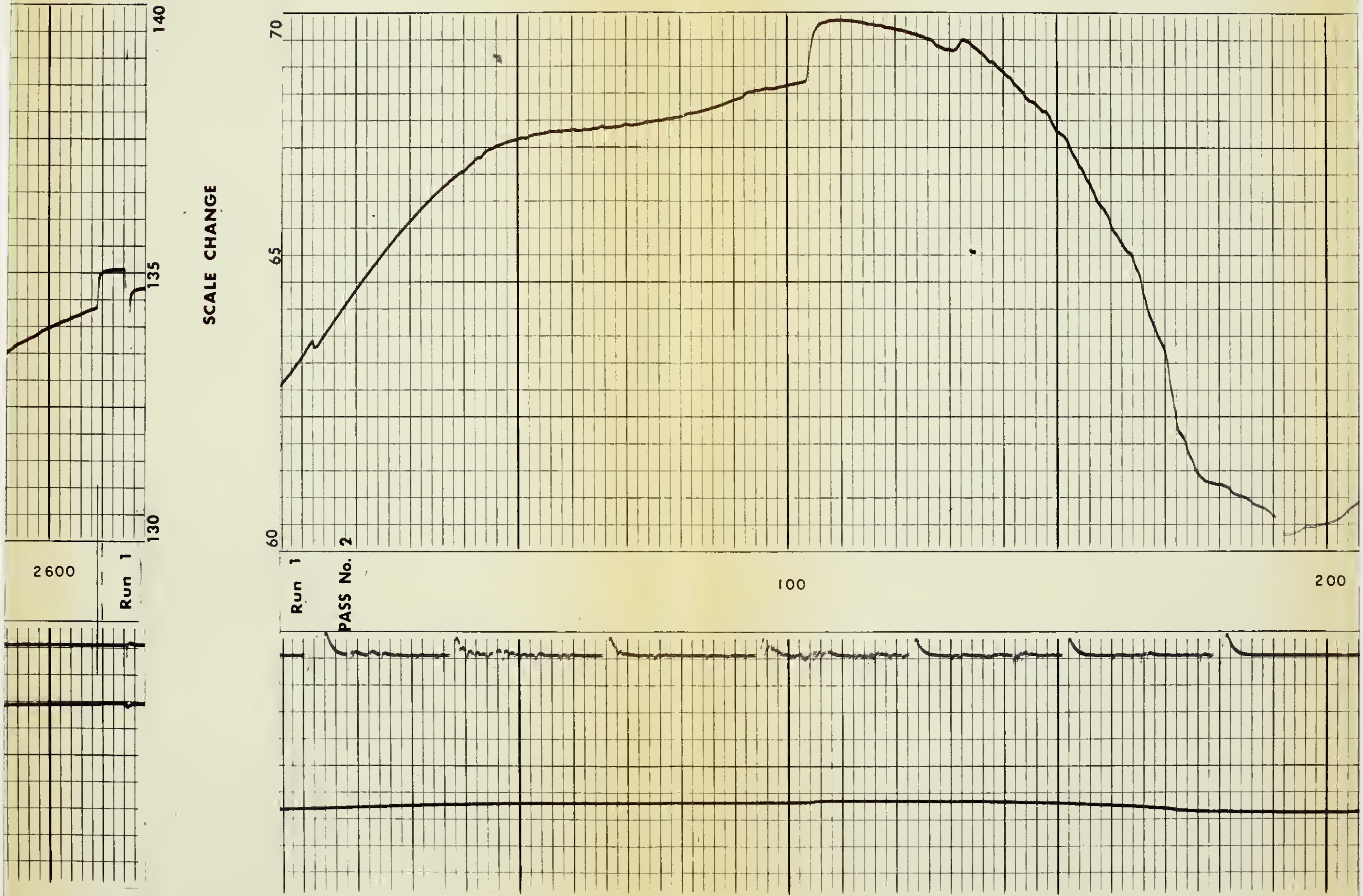

120
115
SCALE CHANGE
110
1900
2000

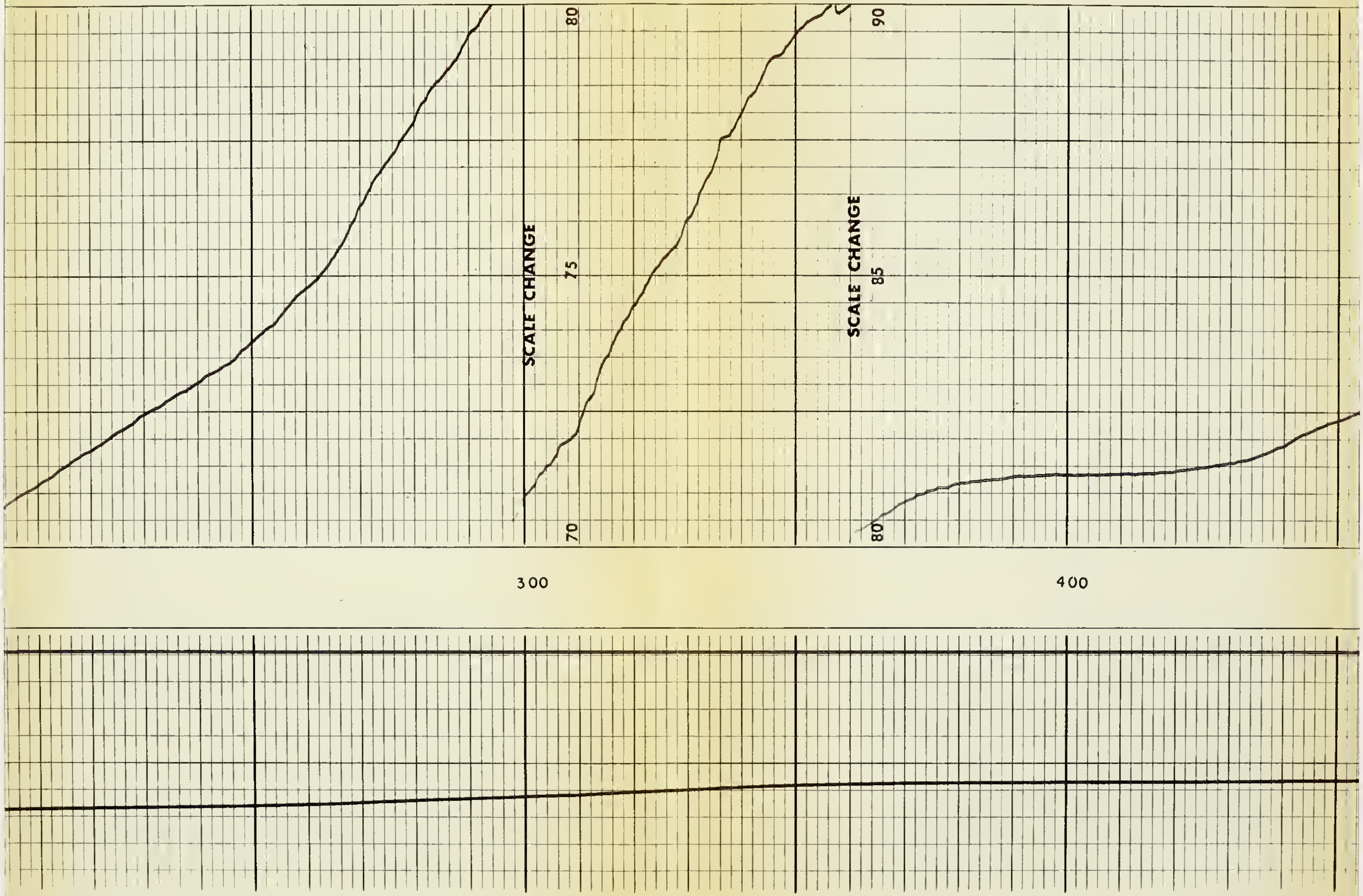

2100
2200
2300

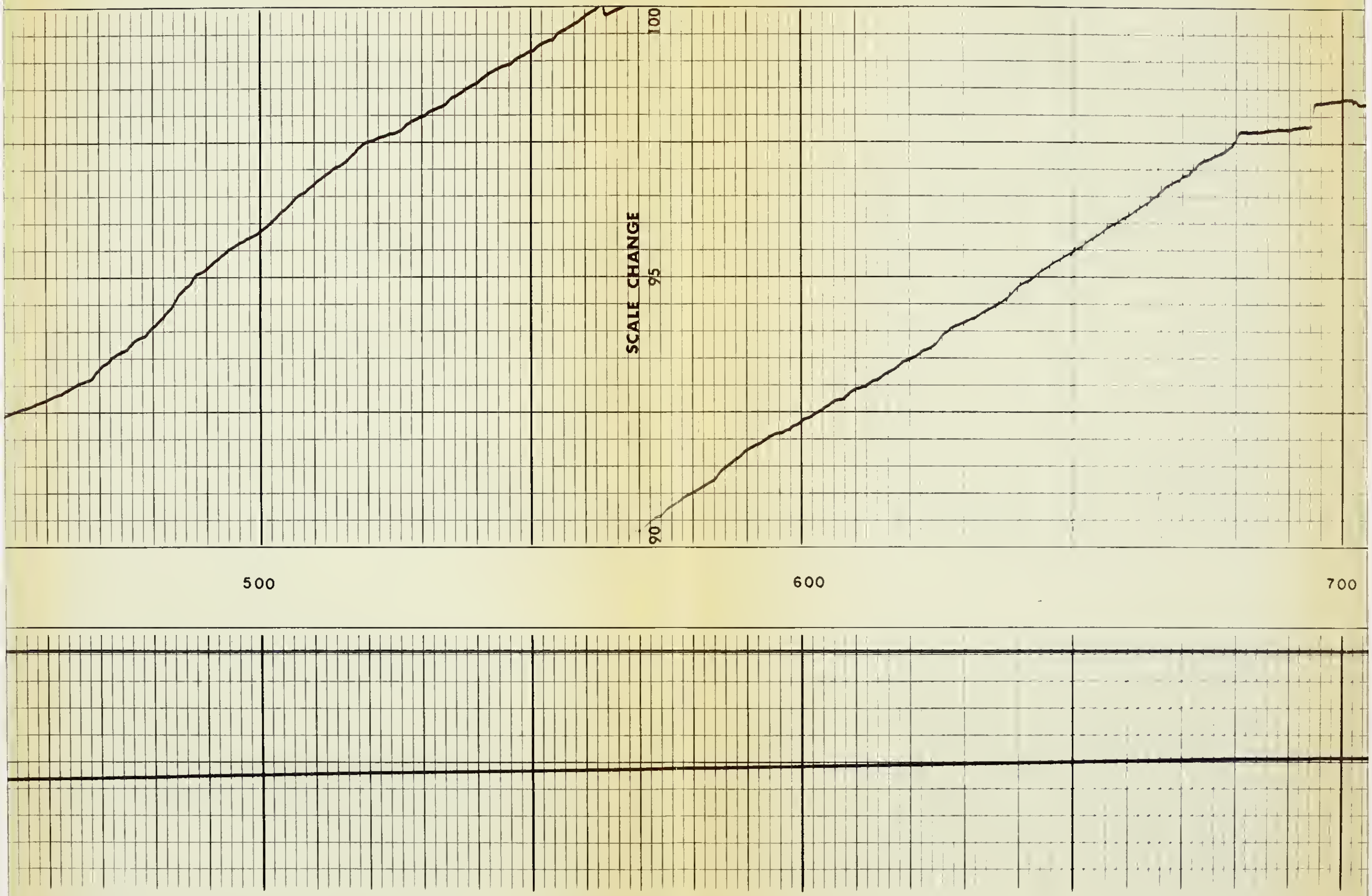

SCALE CHANGE
130
125
120
SCALE CHANGE
140
135
130
2400
2500

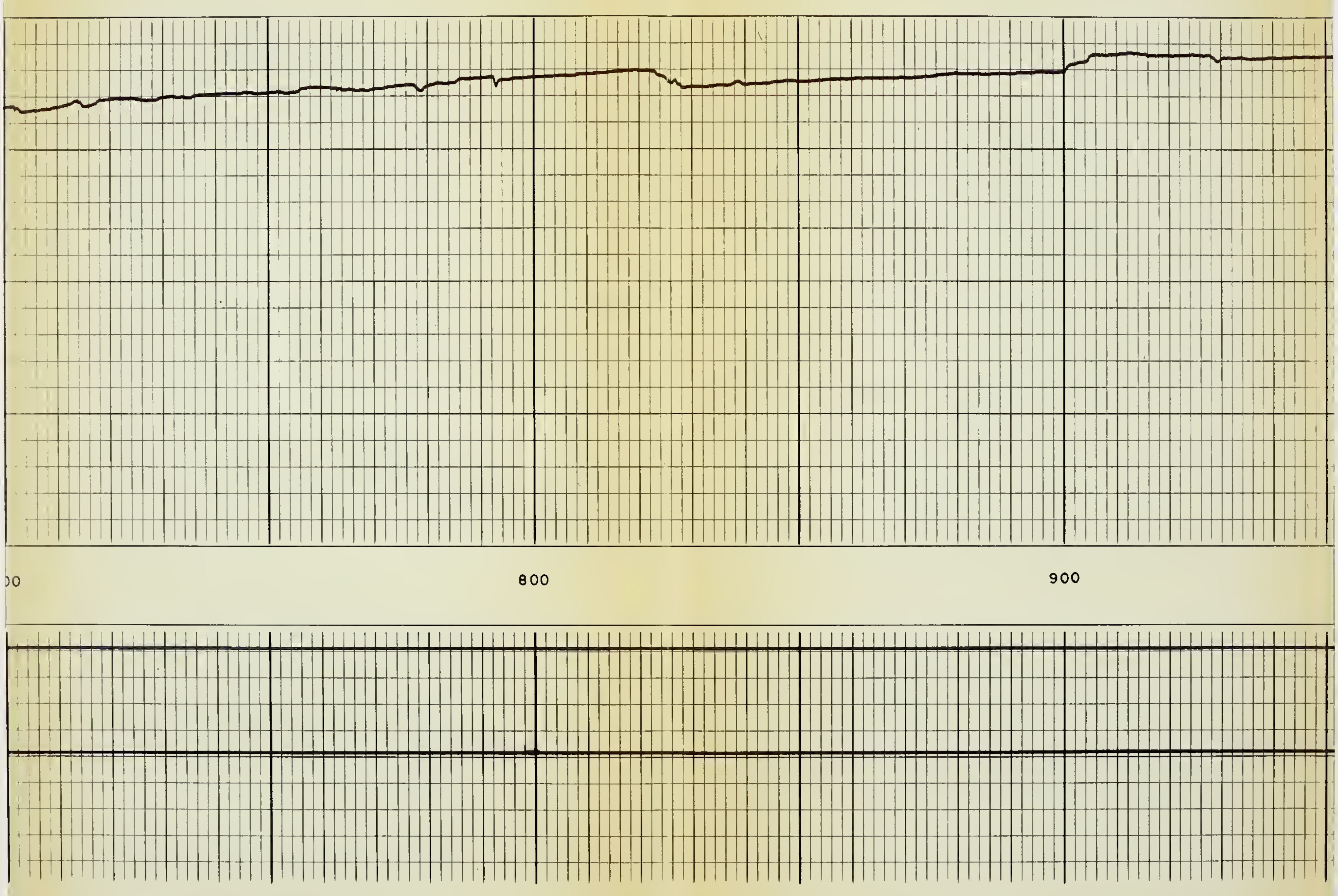

140
135
130
2600
Run 1
SCALE CHANGE
120
115
110
Run 1
2200
2300
130
SCALE CHANGE
125
120

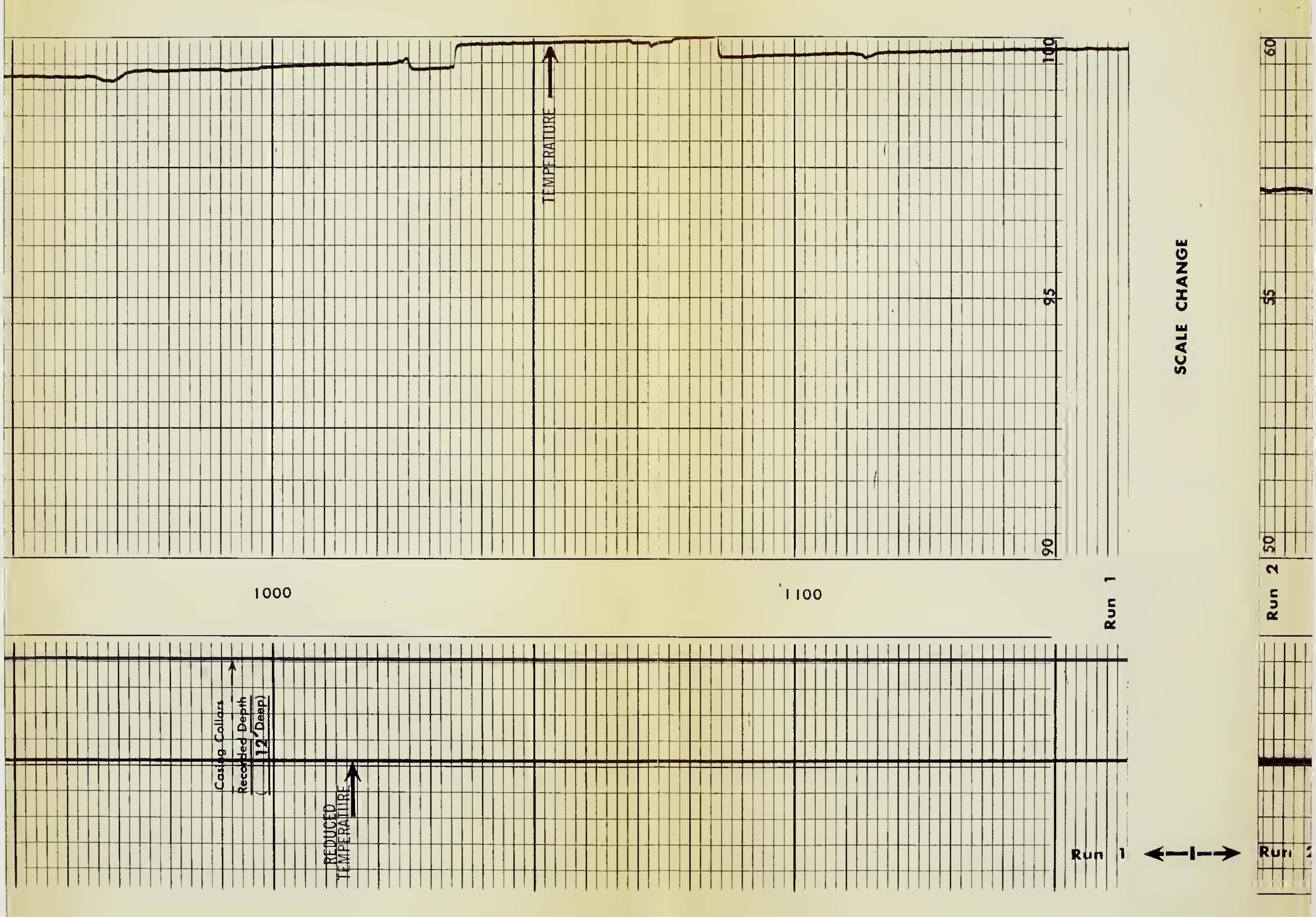

140
SCALE CHANGE
135
130
2400
2500

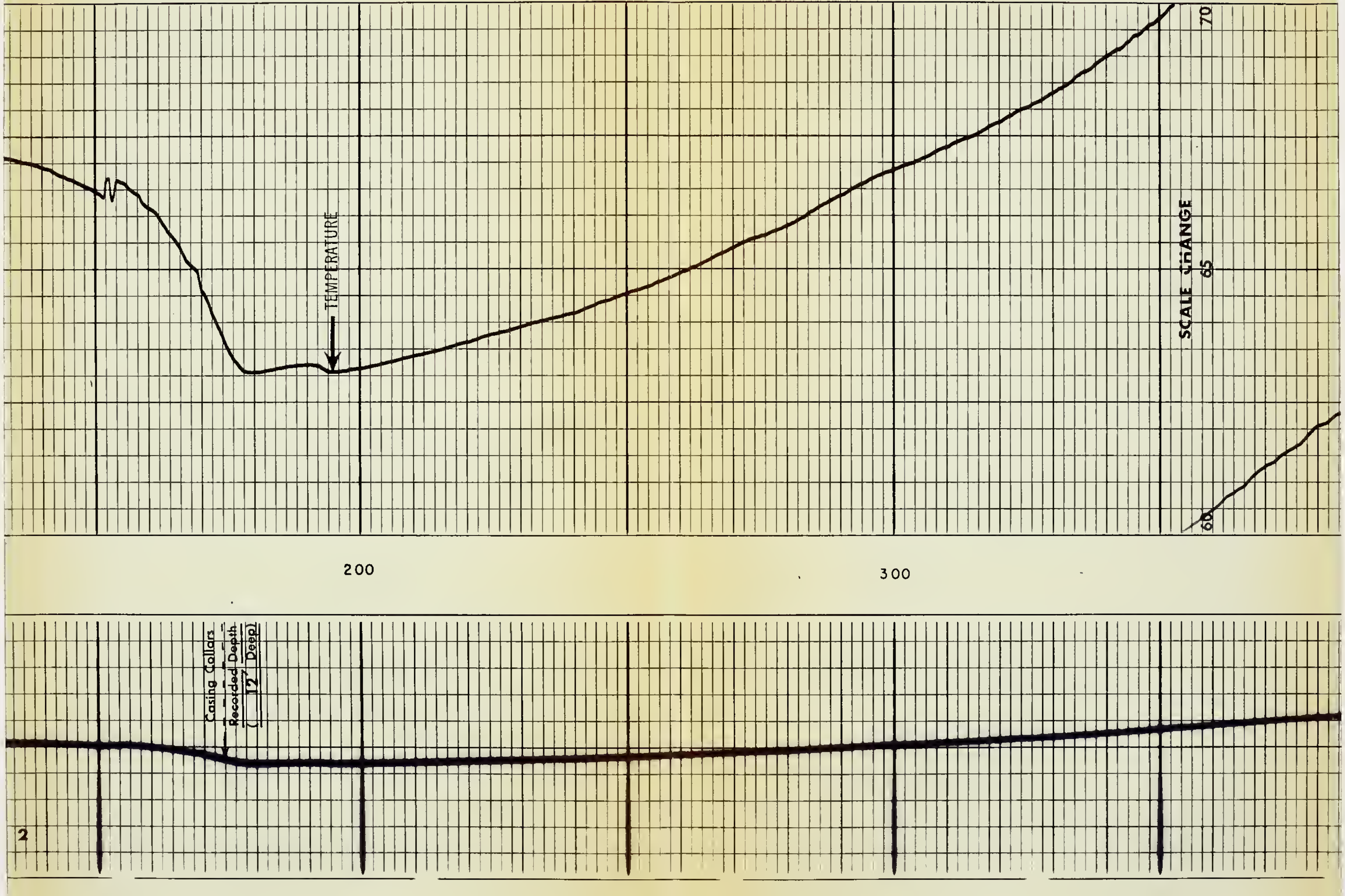

140
135
130
SCALE CHANGE
70
65
60
2600
Run 1
Run 1
PASS No. 2
100
200

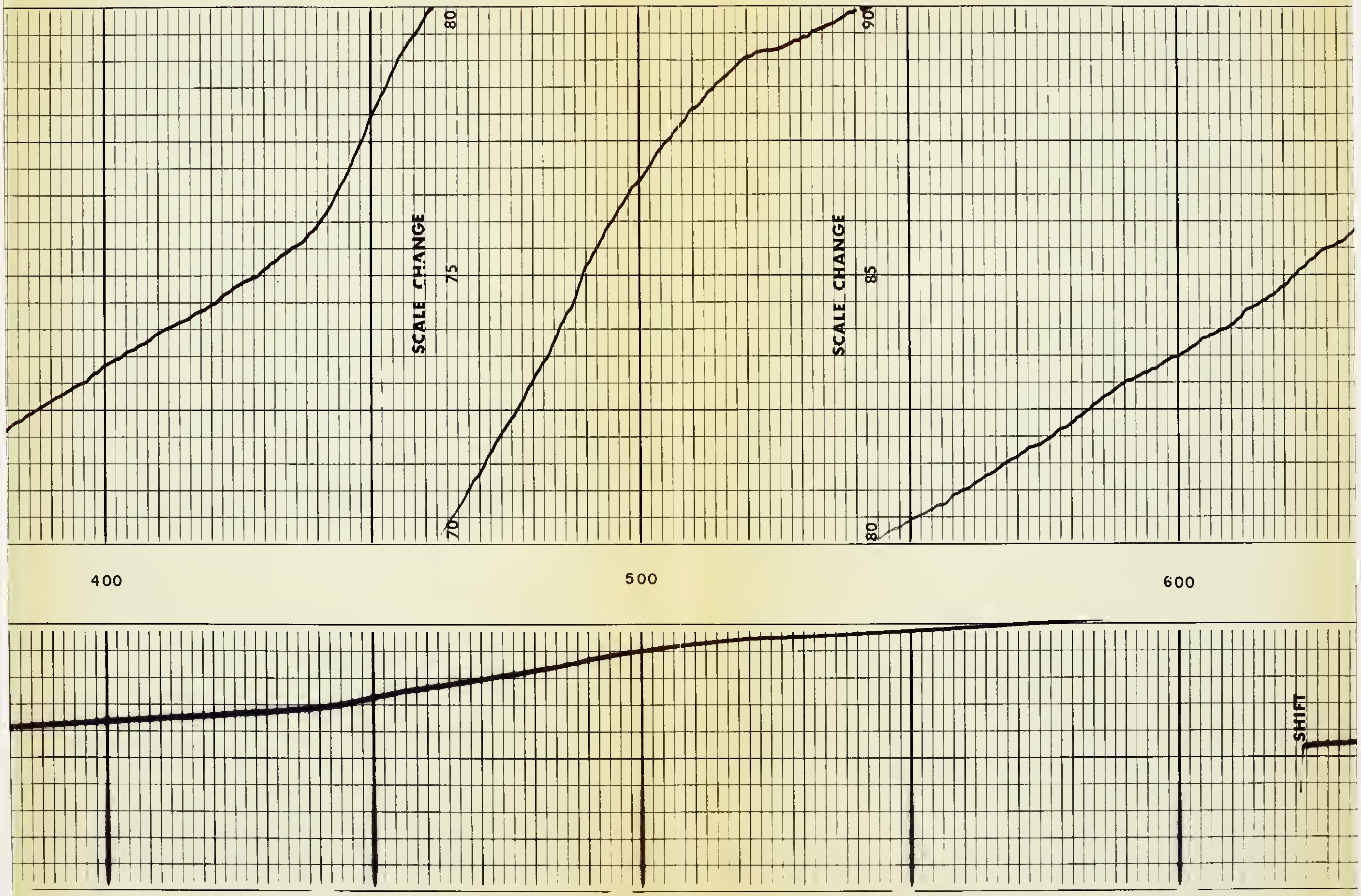

80
75
70
SCALE CHANGE
90
85
80
SCALE CHANGE
300
400

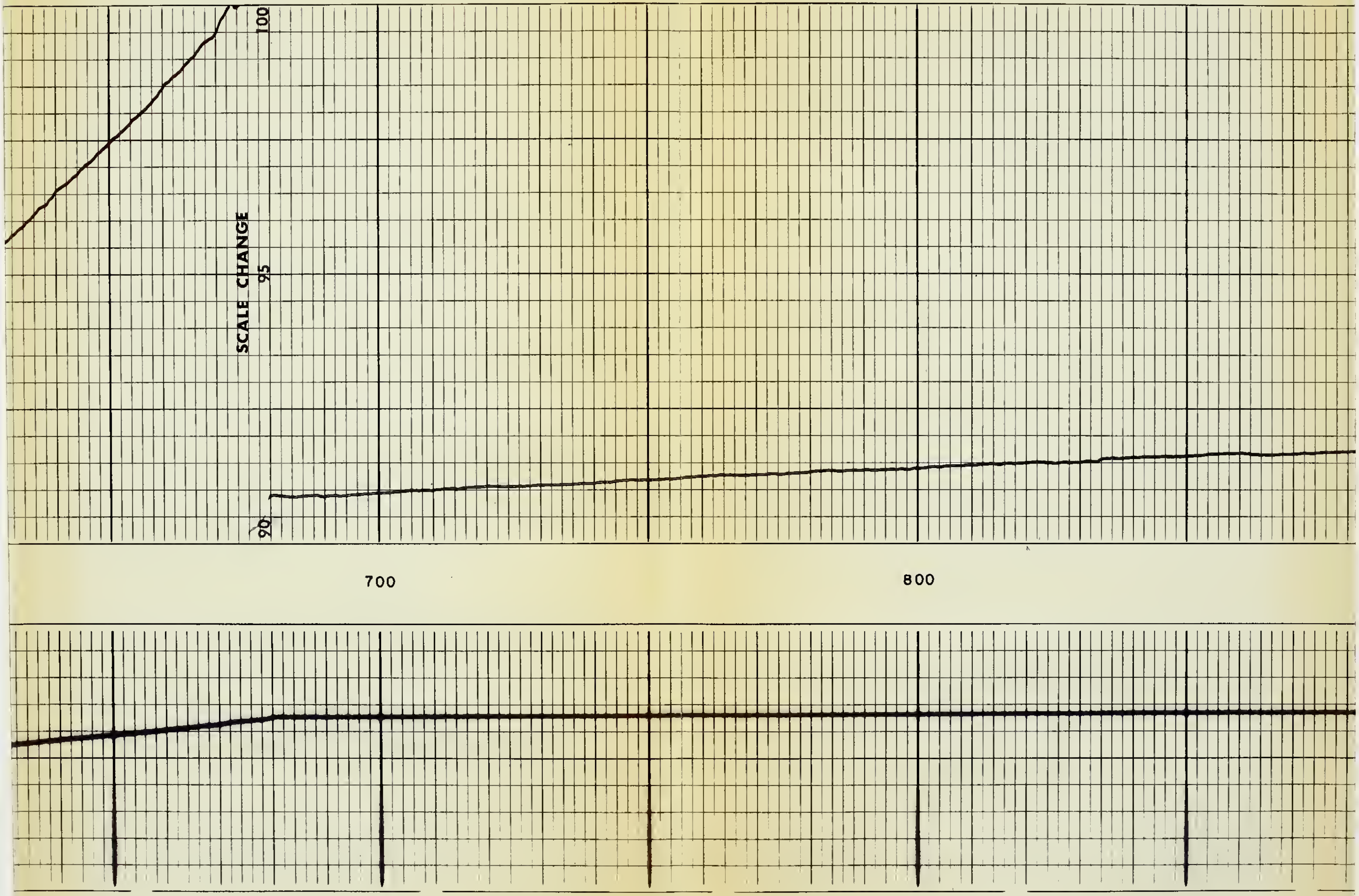

100
SCALE CHANGE
95
90
500
600
700

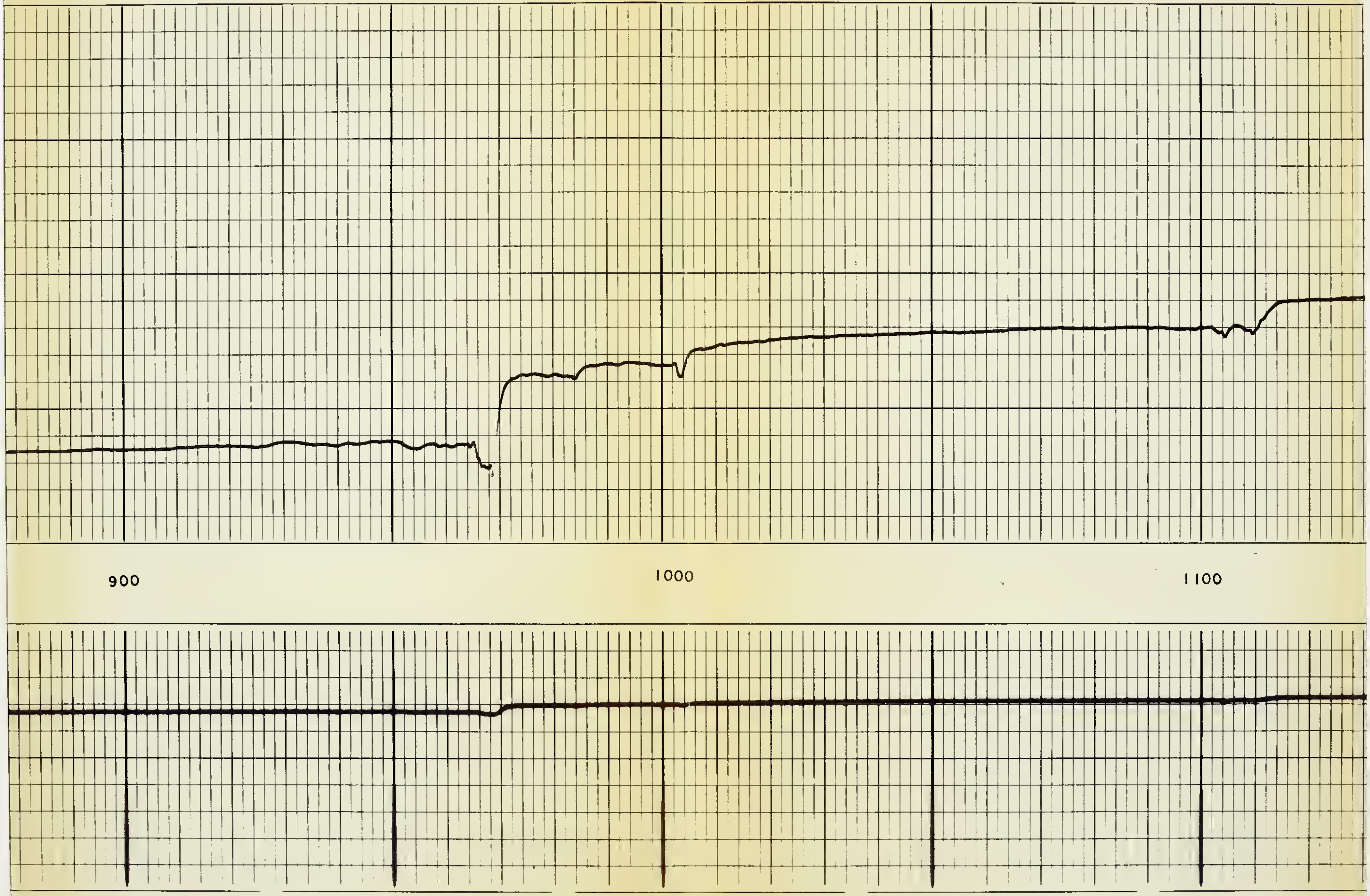

800
900

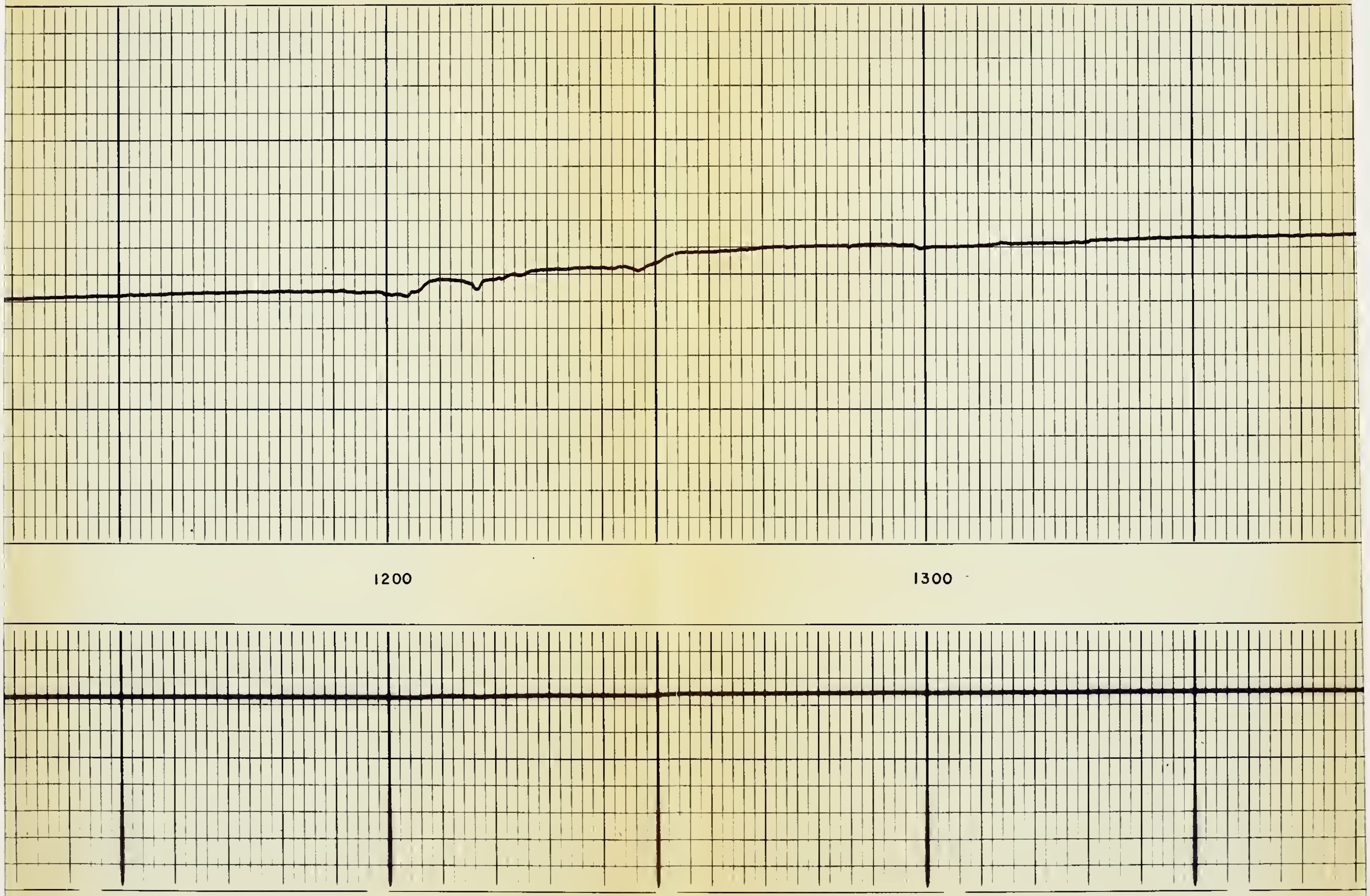

100
95
90
TEMPERATURE
SCALE CHANGE
60
55
50
1000
1100
Run 1
Run 2
Casing Collars
Recorded Depth
(12' Deep)
REDUCED TEMPERATURE
Run 1
Run 2

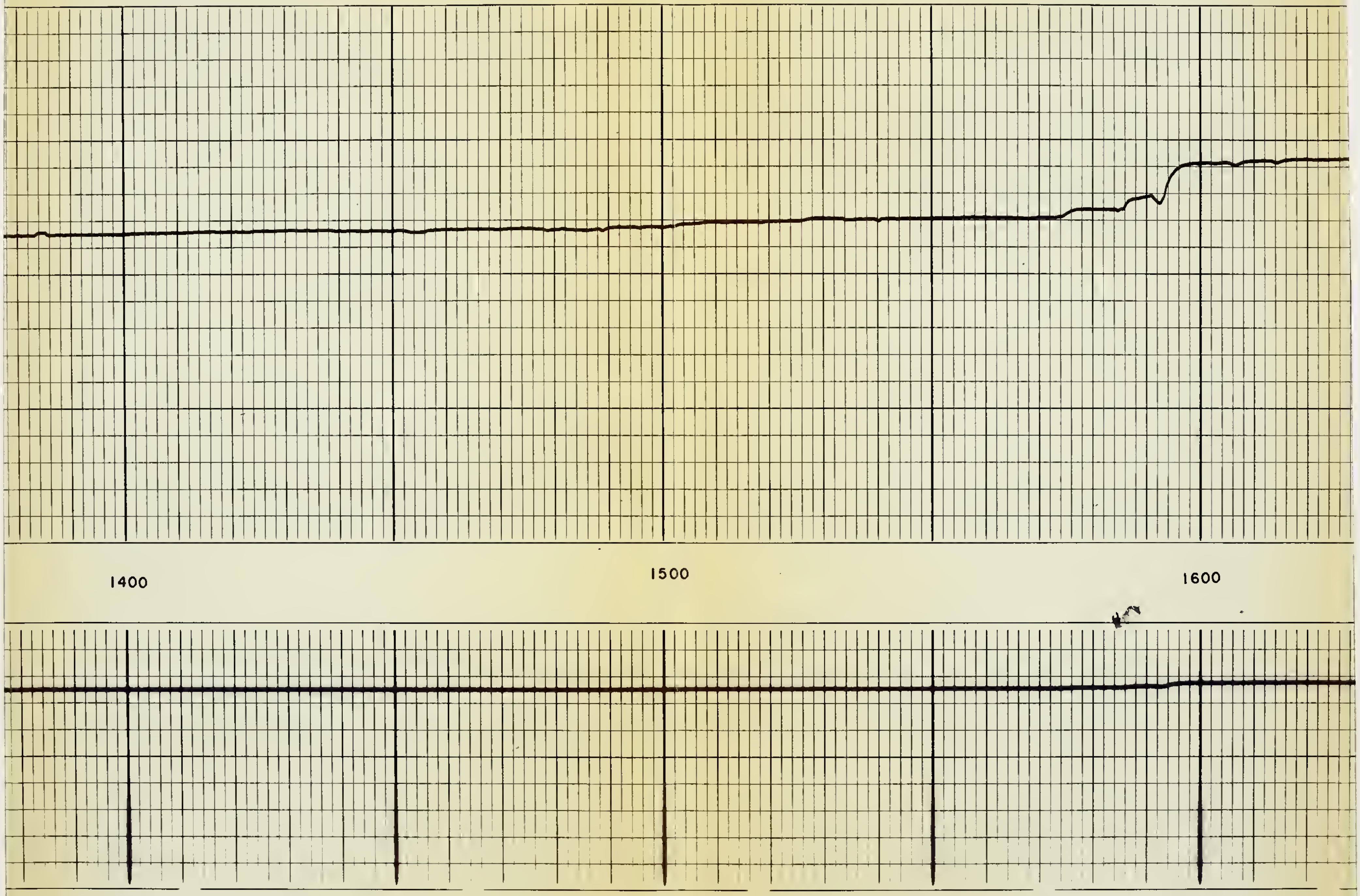

TEMPERATURE
SCALE CHANGE
70
65
60
200
300
Casing Collars
Recorded Depth
(12' Deep)
2

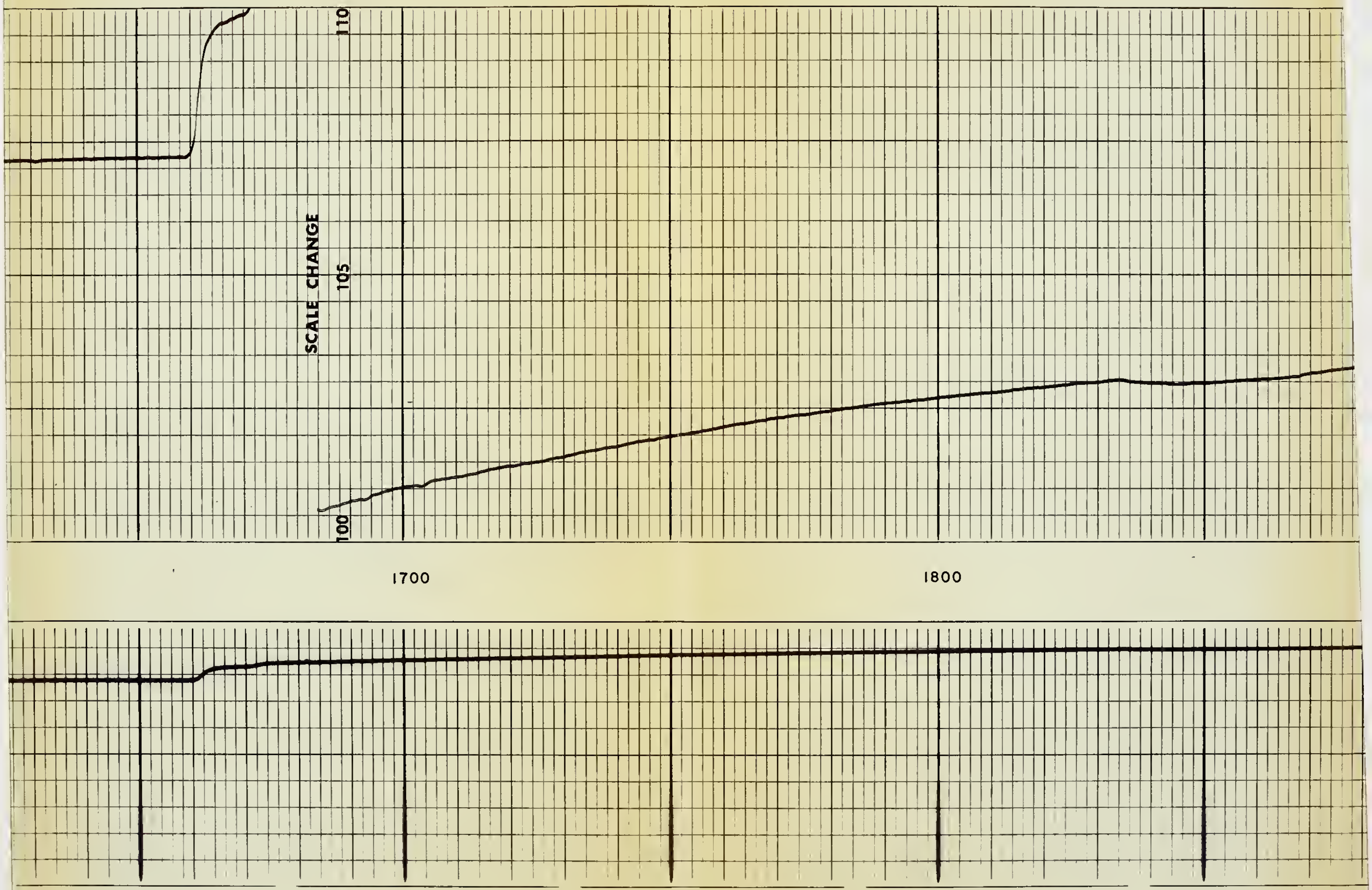

80
75
70
SCALE CHANGE
90
85
80
SCALE CHANGE
400
500
600
SHIFT

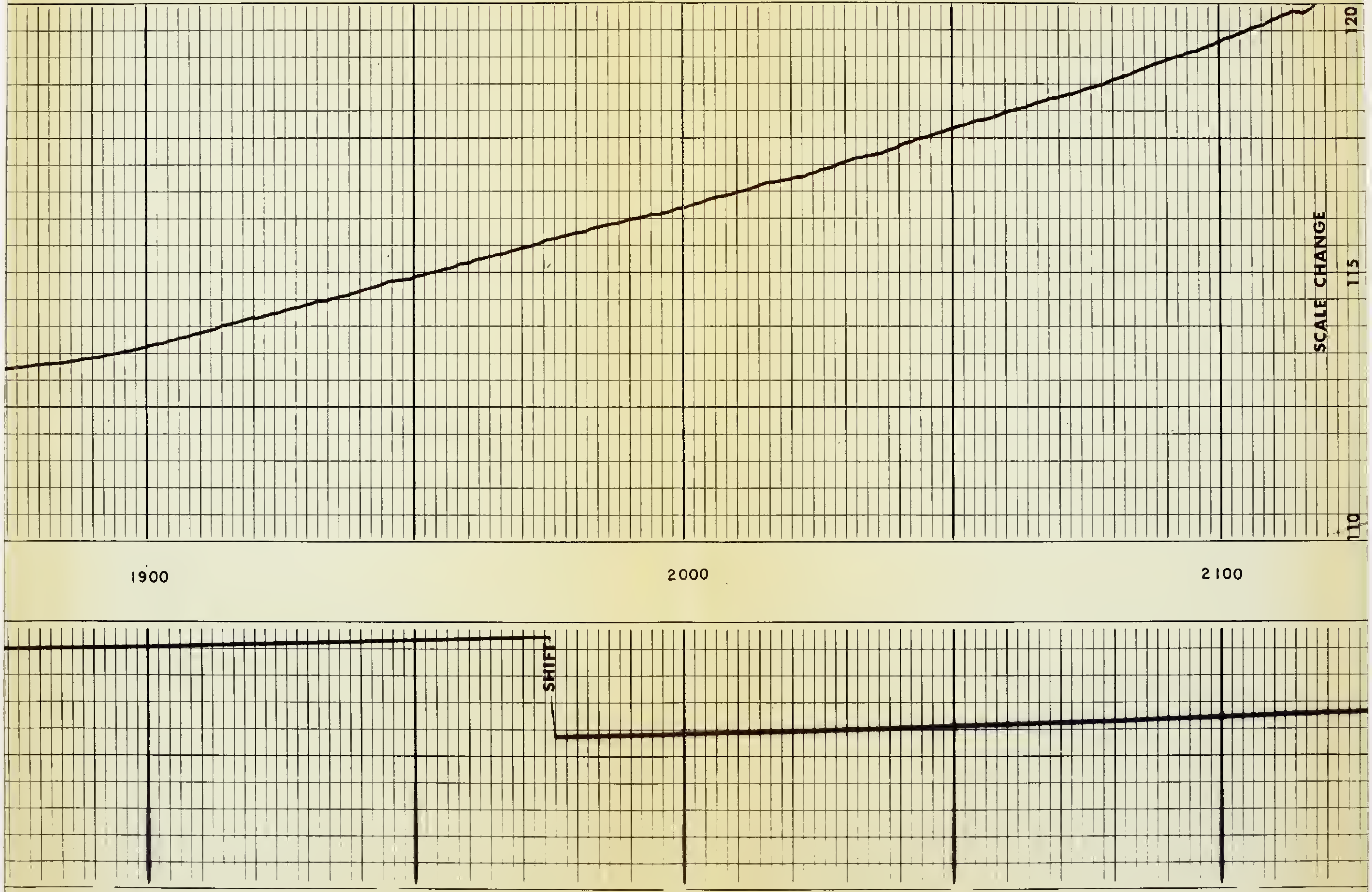

100
SCALE CHANGE
95
90
700
800

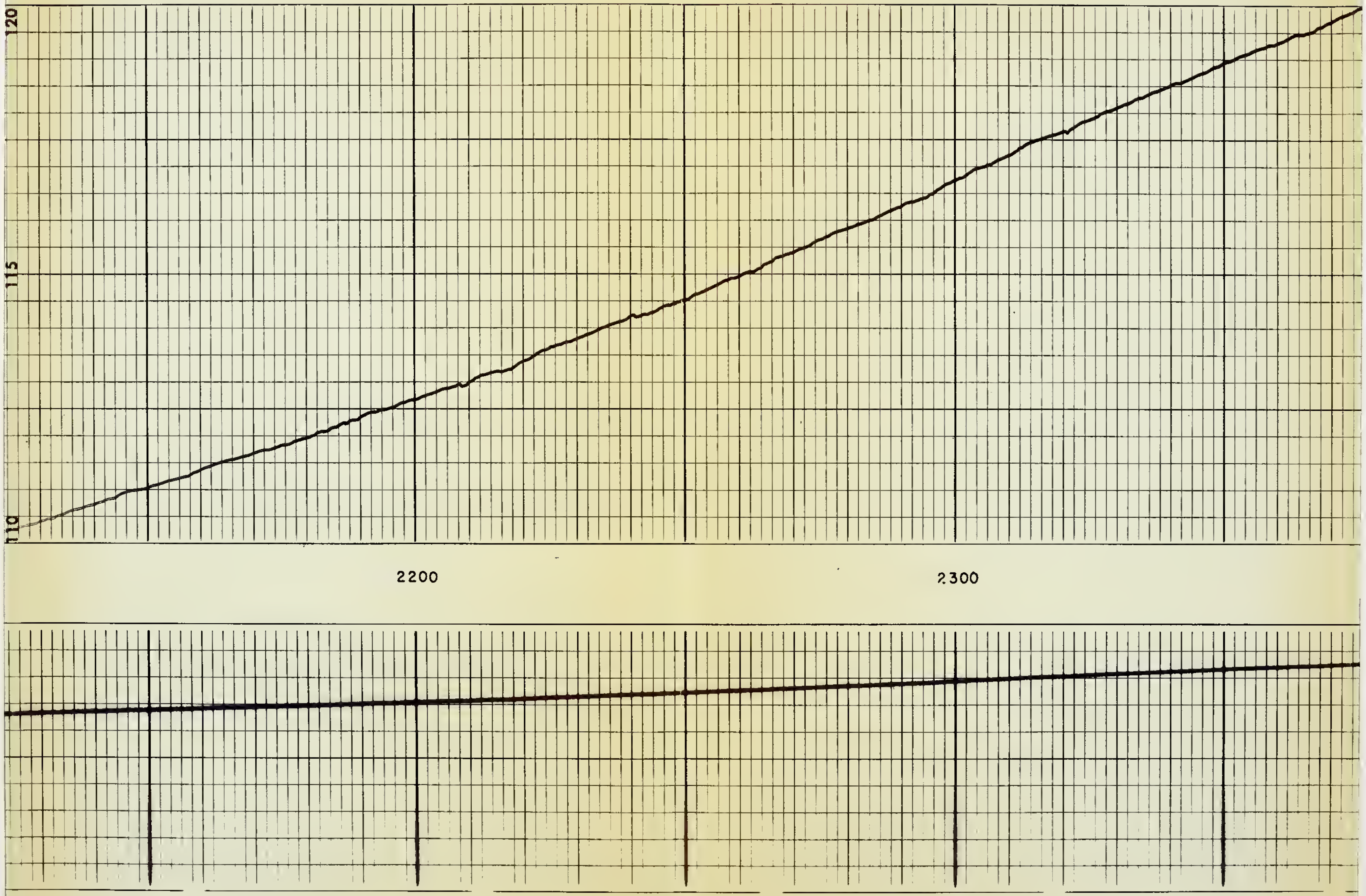

900
1000
1100

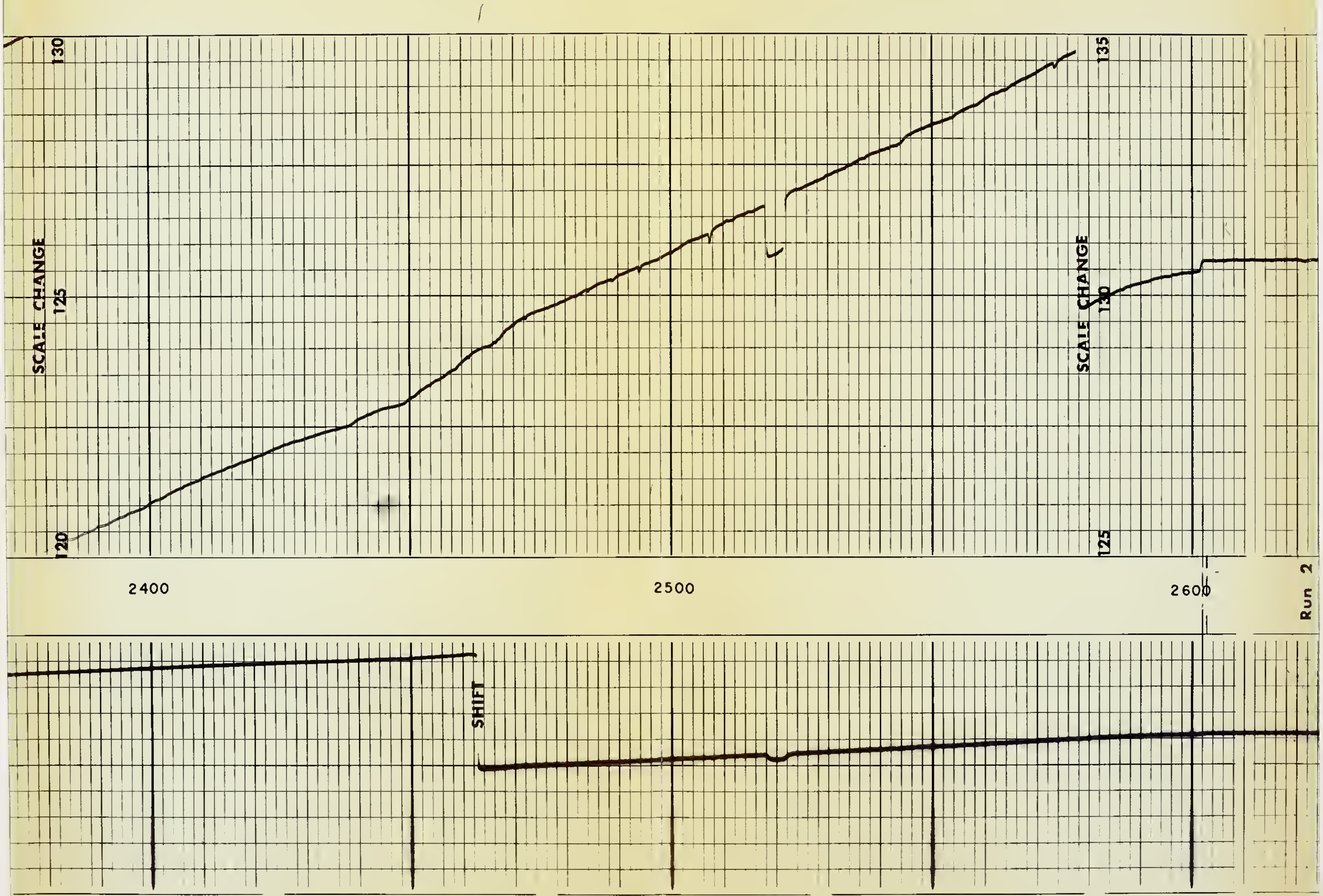

1200
1300

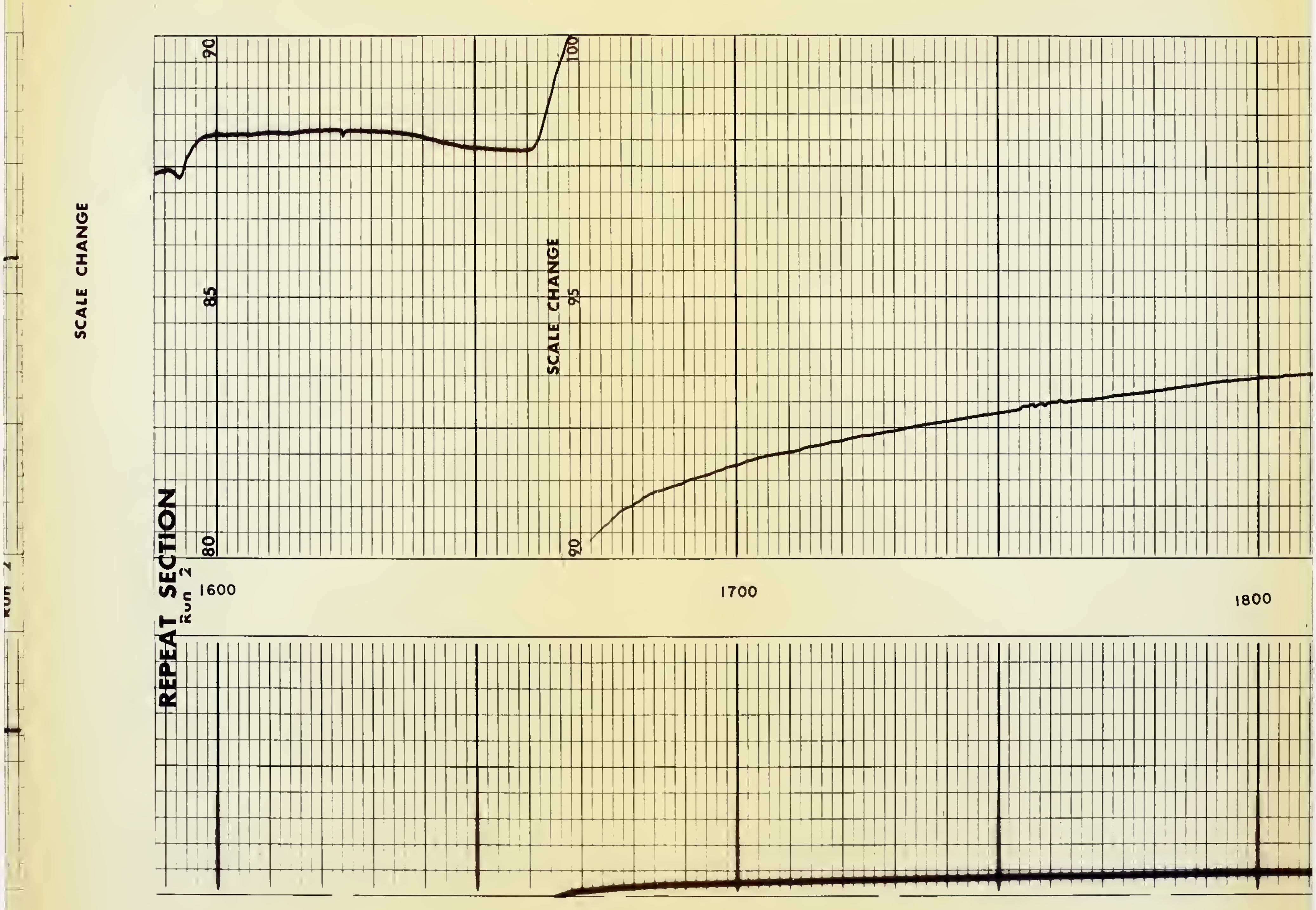

1400
1500
1600

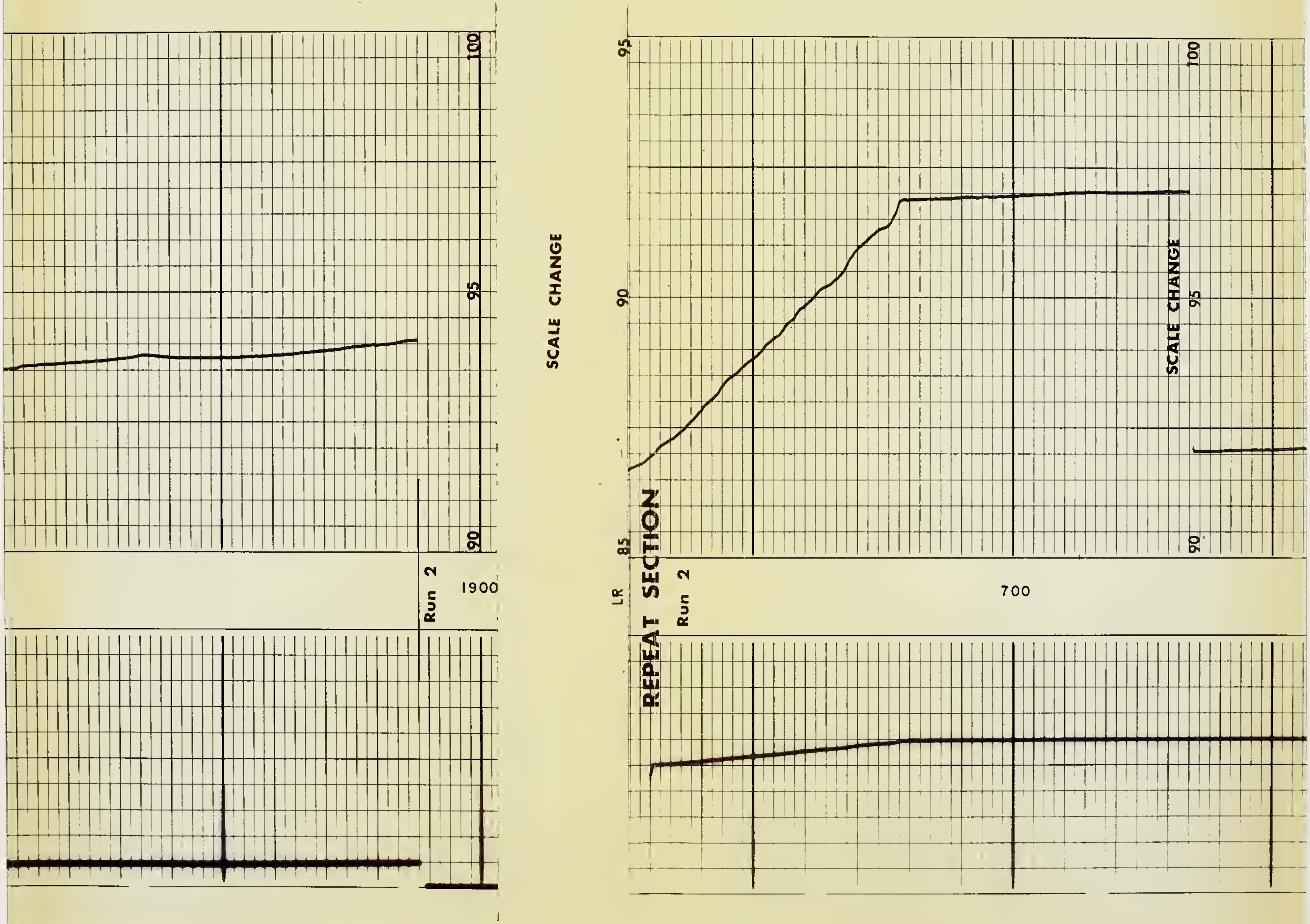

110
SCALE CHANGE
105
100
1700
1800

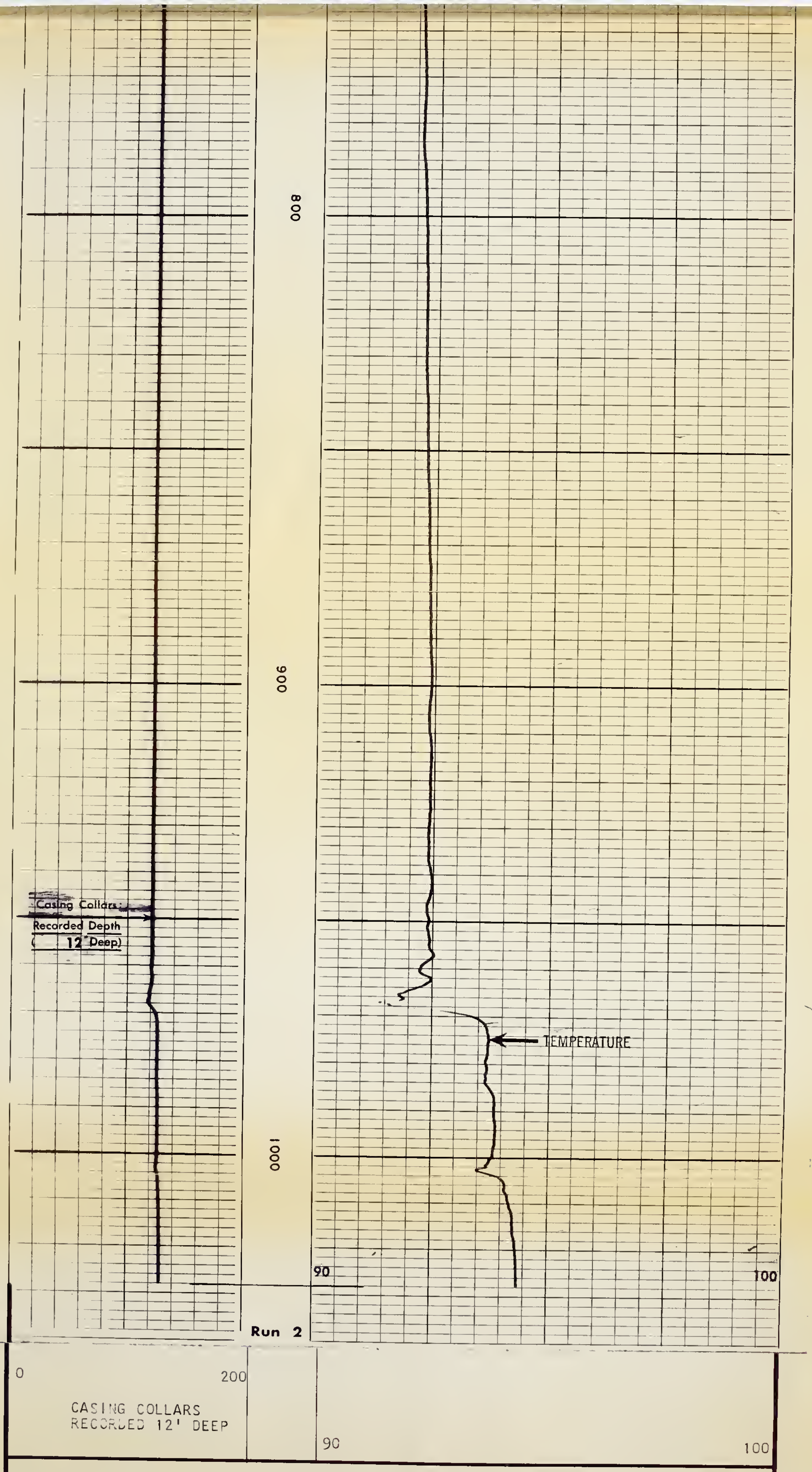

120
115
110
SCALE CHANGE
1900
2000
2100
SHIFT


120
115
110
2200
2300


SCALE CHANGE
130
125
120
135
SCALE CHANGE
130
125
2400
2500
2600
Run 2
SHIFT


Run 2
SCALE CHANGE
90
85
80
100
95
90
SCALE CHANGE
REPEAT SECTION
Run 2
1600
1700
1800


100
95
90
SCALE CHANGE
Run 2
1900
95
90
85
LR
REPEAT SECTION
Run 2
700
100
95
SCALE CHANGE
90



TEMPERATURE °F.

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #8

FIELD SORGHUM GULCH

COUNTY RIO BLANCO

STATE COLORADO

SCHL. F. R. 2602

SCHL. T. D. 2603

DRLR. T. D. 2608

SG-8

Schlumberger

COMPENSATED FORMATION DENSITY LOG
Gamma-Gamma

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #8
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #8

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

Location:
2600' FWL & 2301' FSL
Sec. 9 Twp. 35S Rge. 96W

Other Services:
HRT
BHC
LL-7
AMP-VDL

Permanent Datum: GL ; Elev.: 6538
Log Measured From GL , 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. 6542
G.L. 6538

Date	11-28-74			
Run No.	ONE			
Depth—Driller	2608			
Depth—Logger	2610			
Btm. Log Interval	2609			
Top Log Interval	170			
Casing—Driller	8 5/8@176	@	@	@
Casing—Logger	169			
Bit Size	6-1/4			
Type Fluid in Hole	WATER			
Fluid Level	100			
Dens. | Visc.				
pH | Fluid Loss	ml	ml	ml	ml
Source of Sample	PIT			
R_m @ Meas. Temp.	3.79 @68 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	CLEAR@ °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	WATER@ °F	@ °F	@ °F	@ °F
Source: R_{mf} | R_{mc}	AIR DRILLED			
R_m @ BHT	2.05 @126 °F	@ °F	@ °F	@ °F
Time Since Circ.	1700 HOURS			
Max. Rec. Temp.	126 °F	°F	°F	°F
Equip. | Location	7674 | VRNL			
Recorded By	ETTER-DALTON			
Witnessed By	BURNS-TAIT			

The well name, location and borehole reference data were furnished by the customer.

FOLD HERE

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

LOGGING DATA

Liquid Density	Grain Density	FDC Selectors Hole Fluid	FDC Selectors Porosity Scale	From	To

REMARKS
Service Order No. - 28182
API Serial No. -
WELL PRODUCING WATER. TOOL' COMING OUT WITH
GLOBS OF OIL & TAR ON THEM.
TIME MARKER DEVICE BLEW CIRCUIT BREAKER SO NO
SPEED INDICATOR. SPEED AT 1300'/HR BY WORD OF
ENGINEERS DALTON & ETTER ONLY

NOTE: PANEL TEST OSCILLATOR BAD

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.		
Depth - Driller		
Type Fluid		
Source of Sample		
R_m @ Meas. Temp.	@ °F	@ °F
R_{mf} @ Meas. Temp.	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F
R_m @ BHT	@ °F	@ °F
Dens. | Visc.		
ph | Fluid Loss	ml	ml
% Water by Vol.		
% Oil by Vol.		
% Solids by Vol.		
Solids Av. Sp. Gr.		

EQUIPMENT DATA

Run No.	ONE			
Panel No.	355			
Cart No.	333			
Skid No.	522			
Sonde No.	235			
Source	2940			
Calibrator	545			
GR Cart.	[illegible]			
TTR	-			
Mem Panel	1.3			

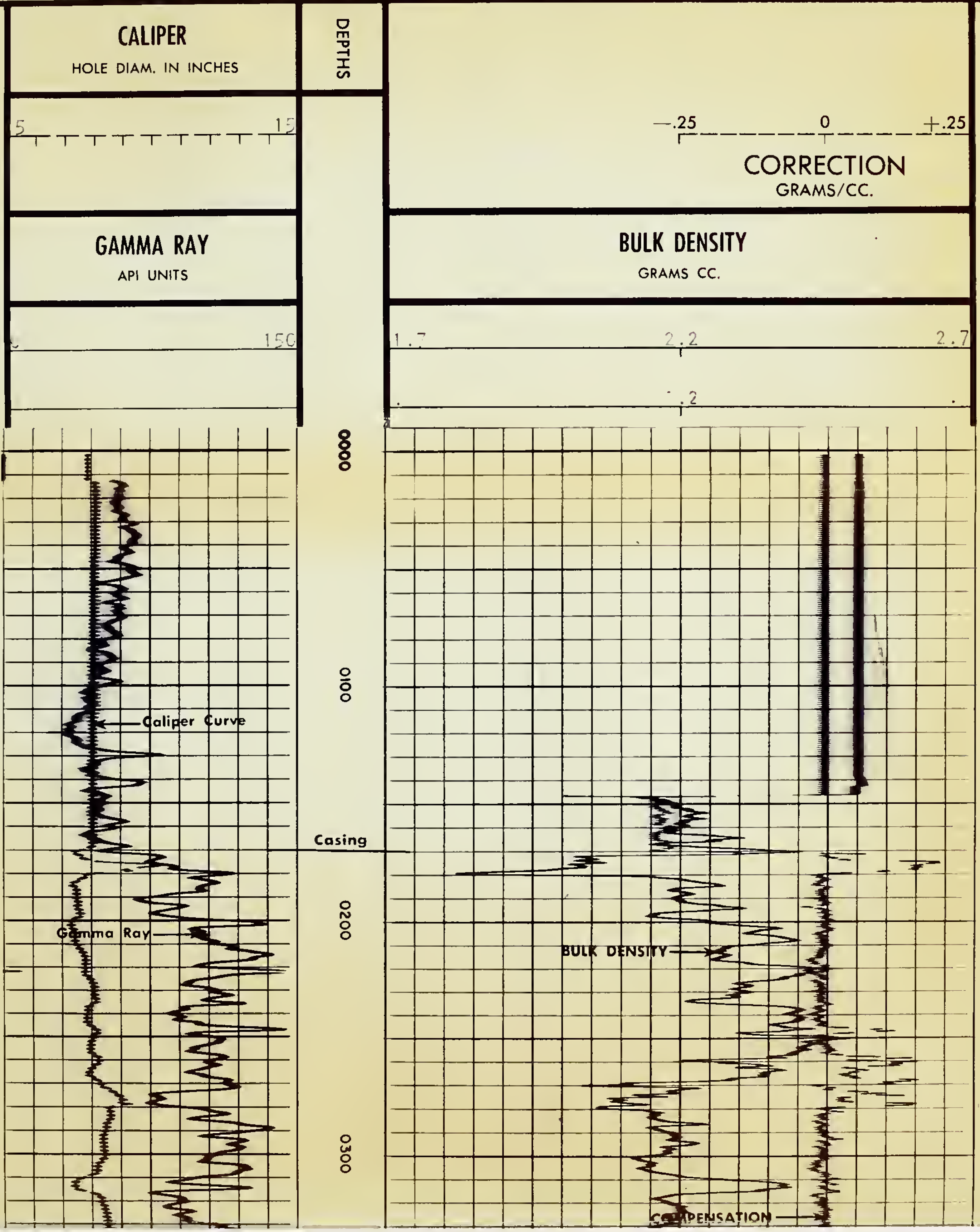
BIT SIZE/CASING DATA

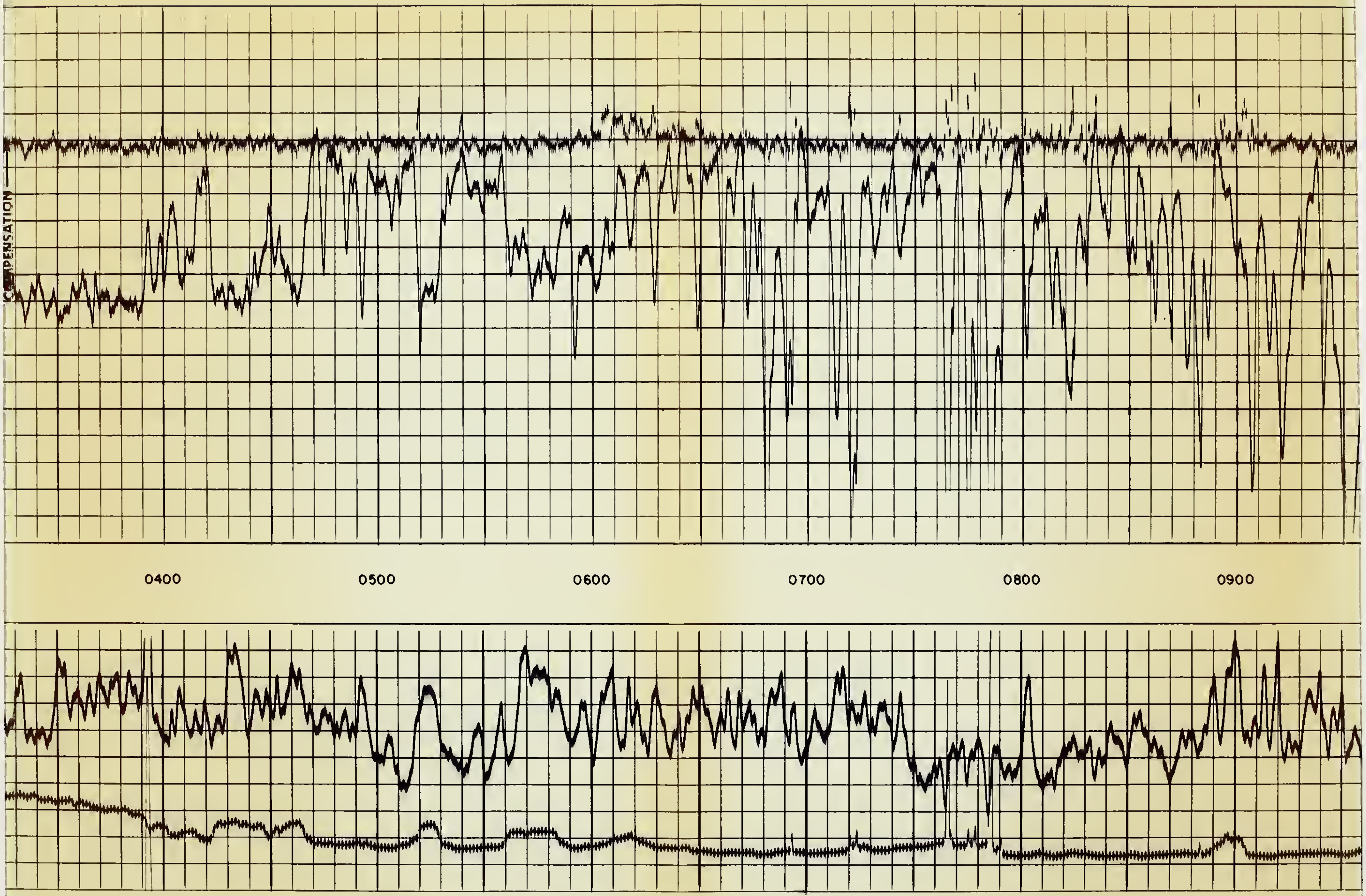
Bit	From	To	Csg. Size	Csg. Wt.	From	To
6 1/4	176	2608	8 5/8		GL	176

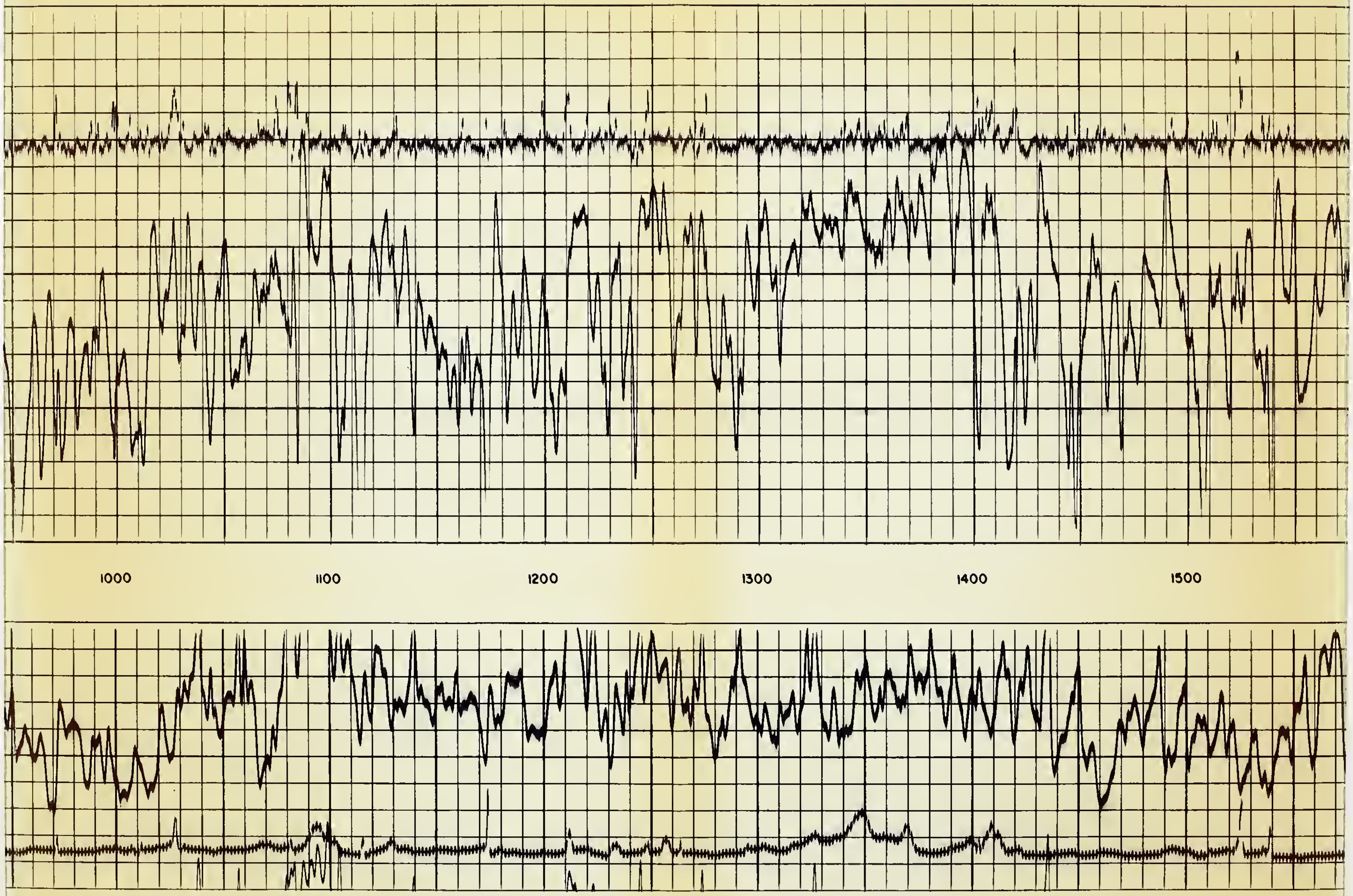
CALIBRATION DATA

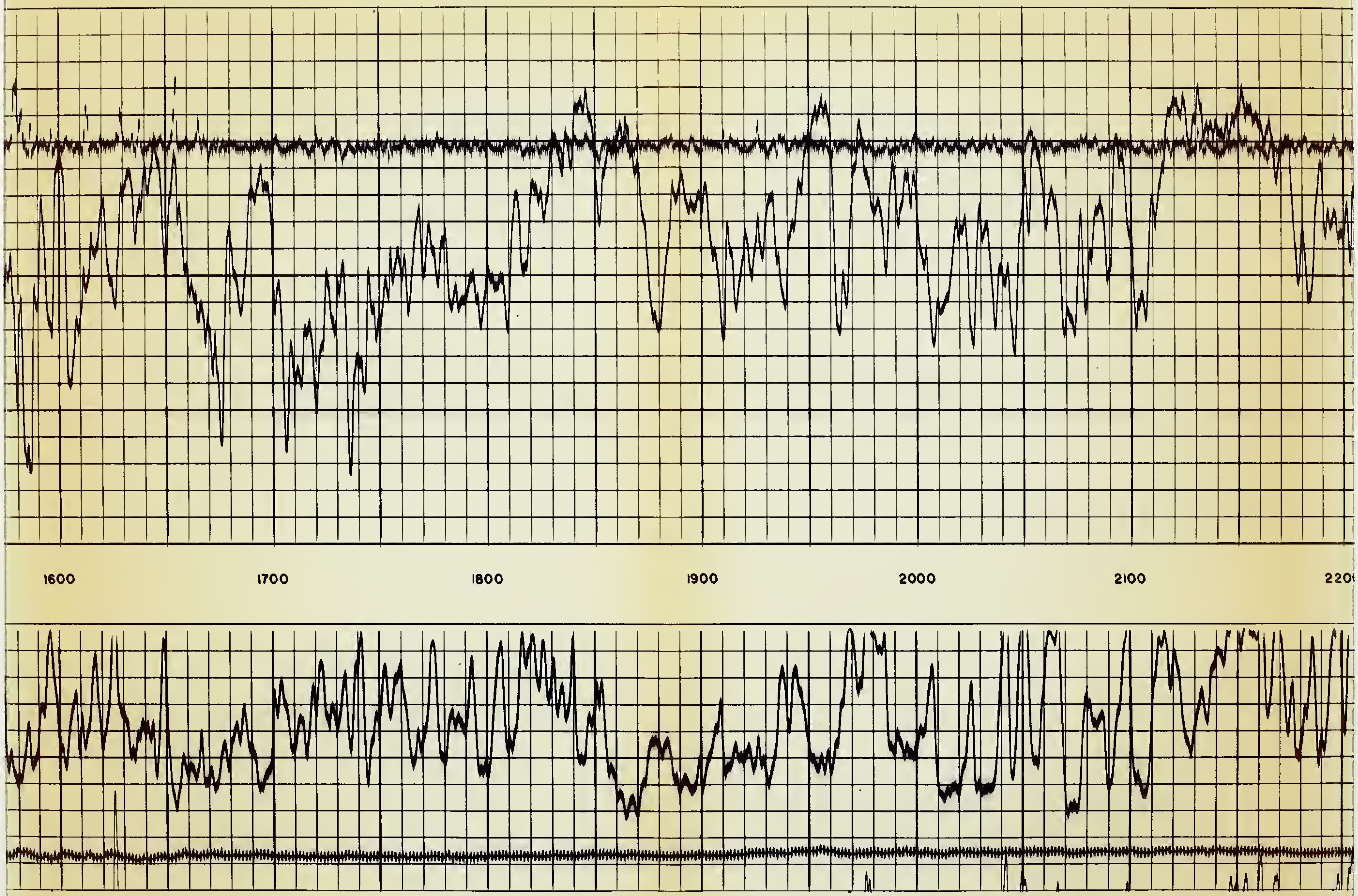
Run No.	Gamma Ray			FDC — Before Log — ACPS		FDC — After Log — ACPS	
	API Scale	Background CPS	Total CPS	P_1	P_2	P_1	P_2
1	0-165	90	530	390	560	392	560
2							
3							
4							

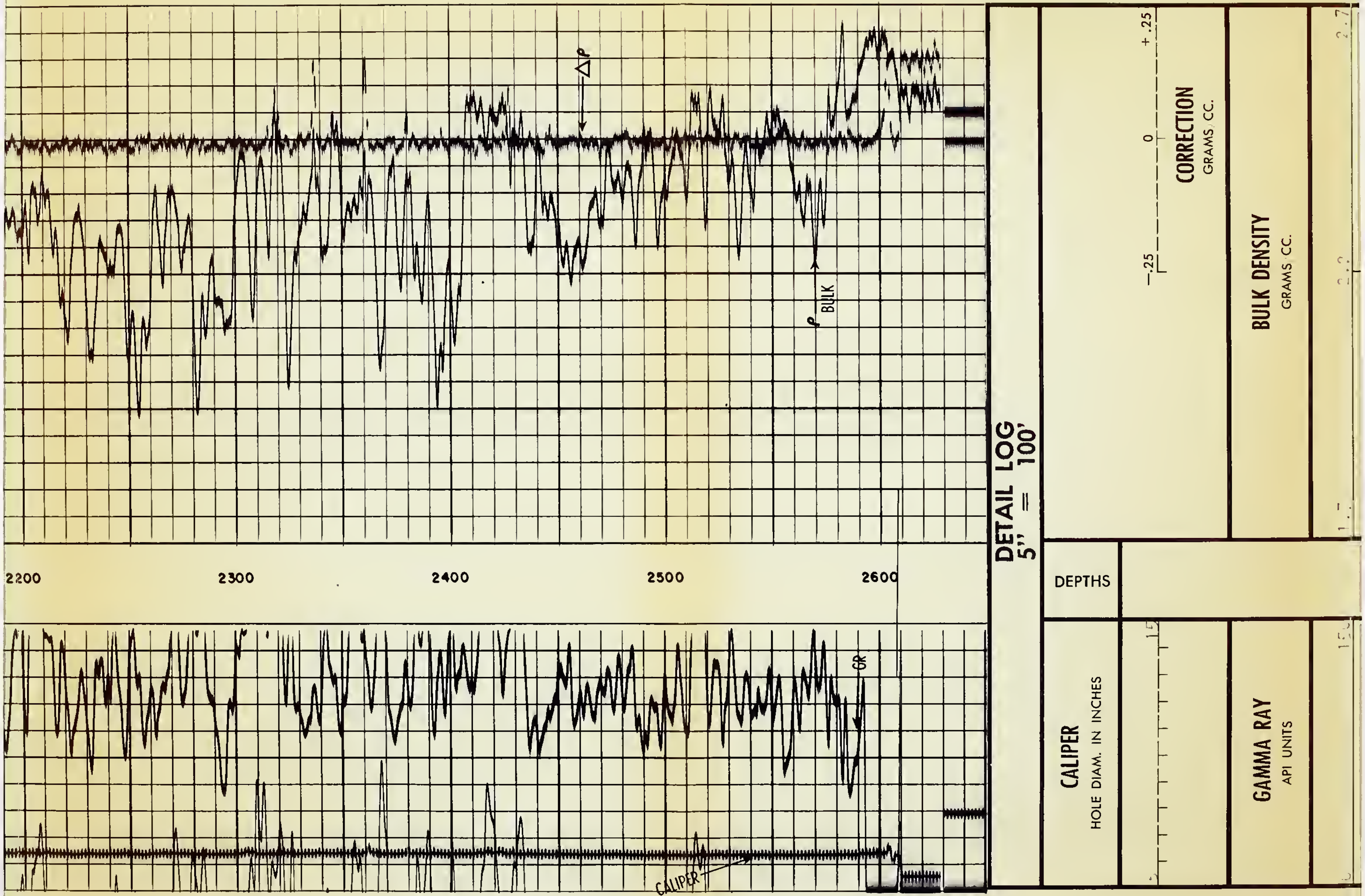
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

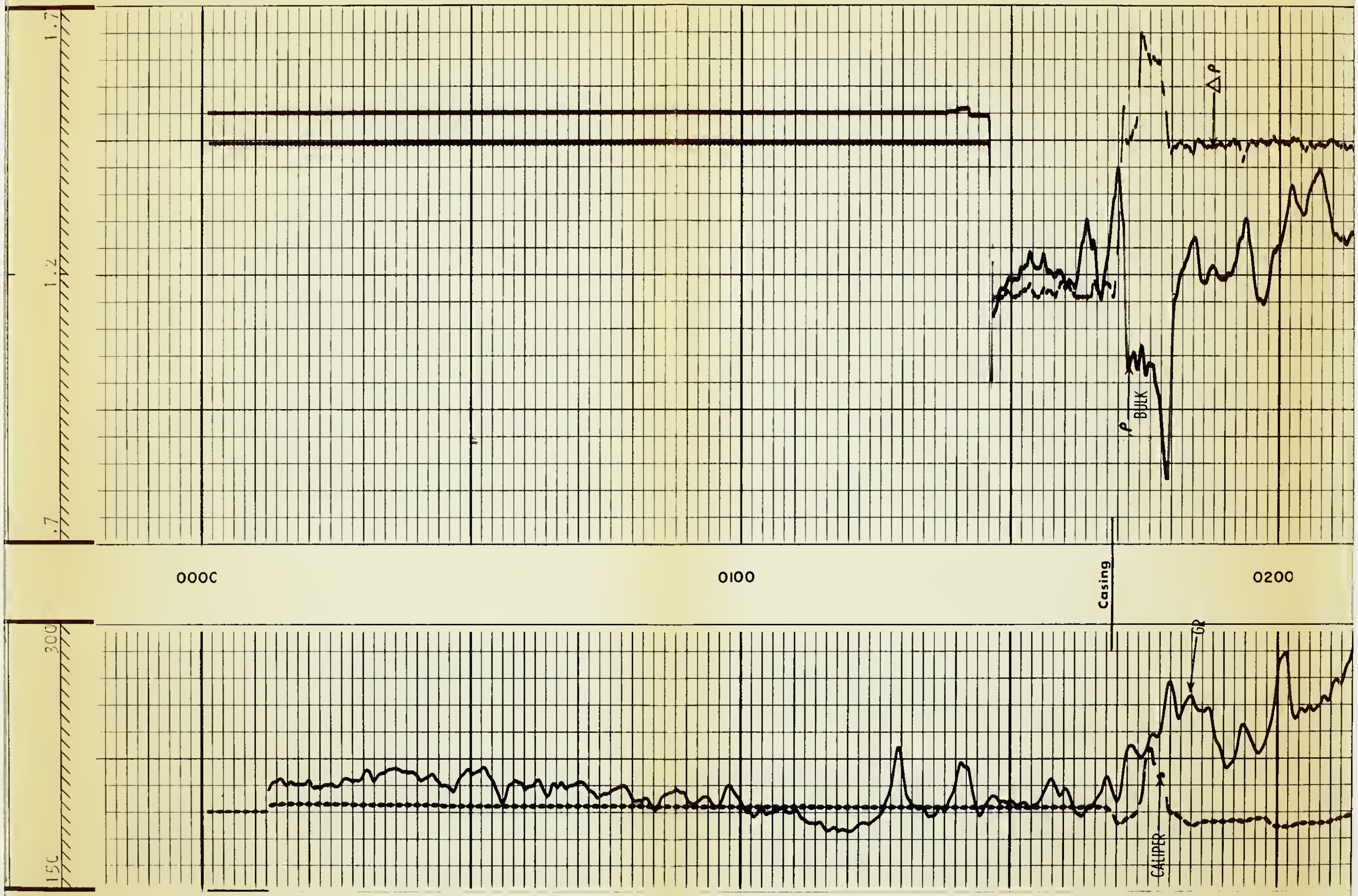


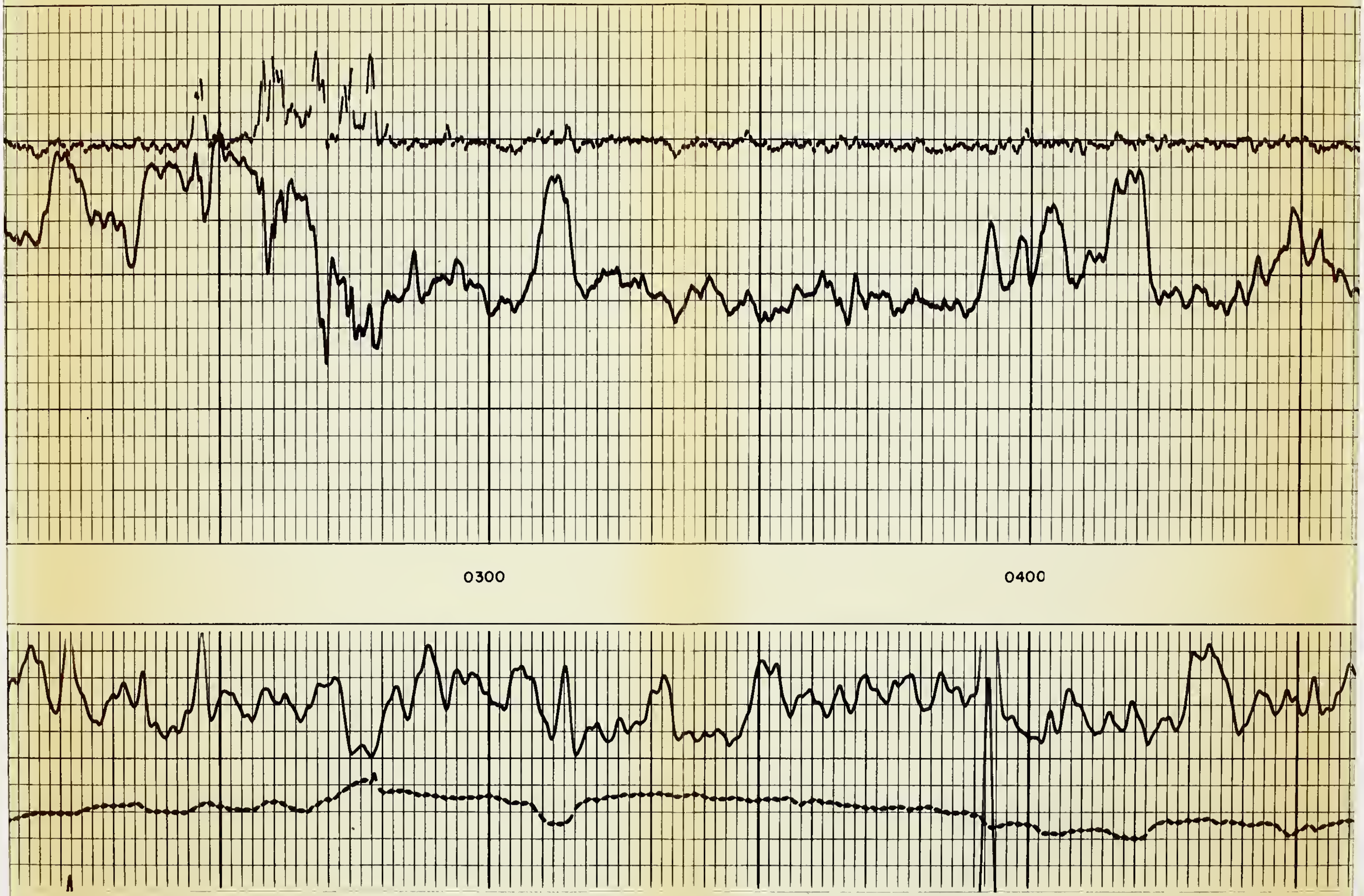

COMPENSATION
0400
0500
0600
0700
0800
0900

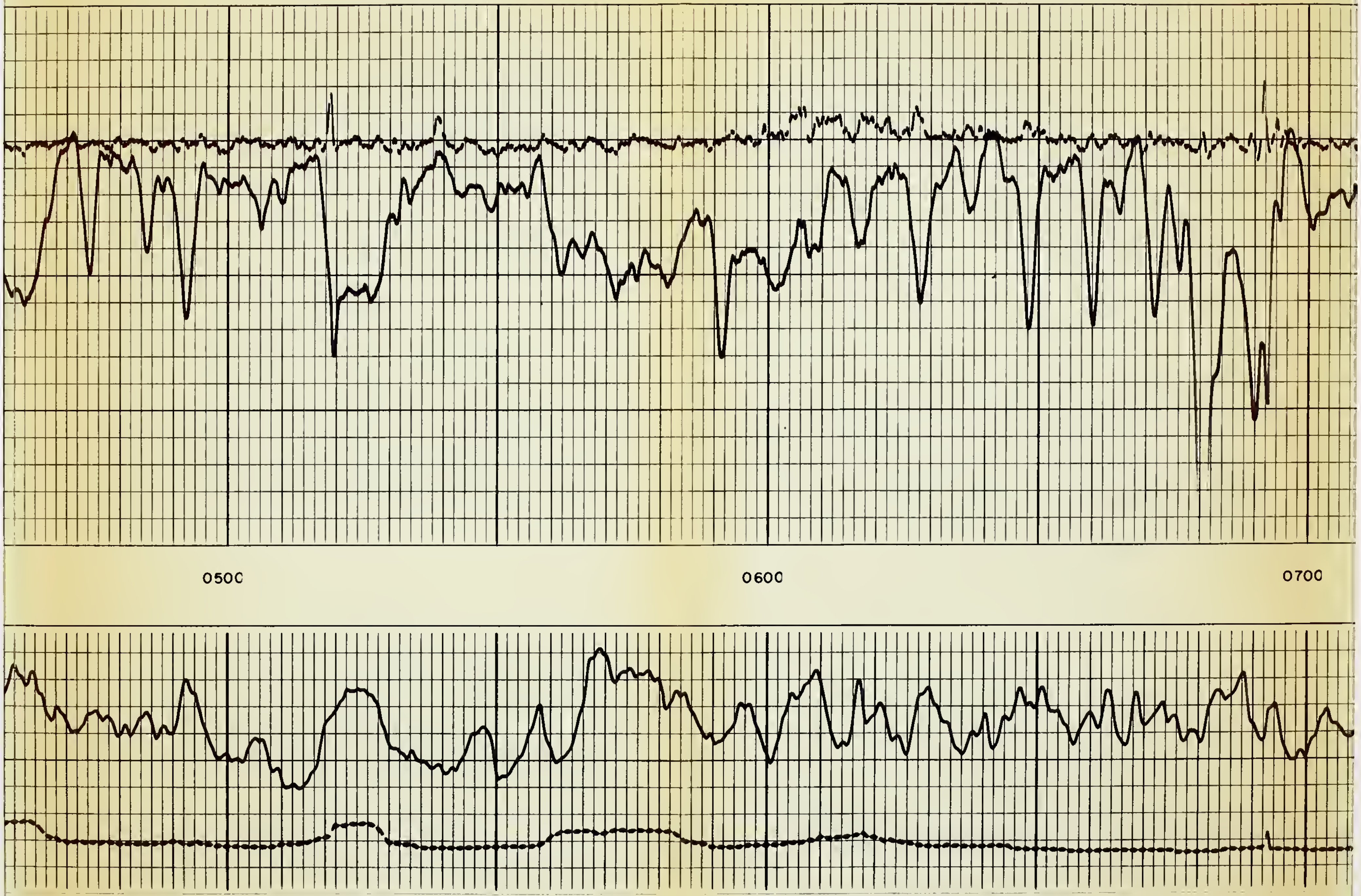

1000
1100
1200
1300
1400
1500


1600
1700
1800
1900
2000
2100
220


DETAIL LOG
5" = 100'
DEPTHS
2200
2300
2400
2500
2600
CORRECTION
GRAMS/CC.
+.25
0
−.25
BULK DENSITY
GRAMS/CC.
2.7
2.2
1.7
Δρ
ρ BULK
CALIPER
HOLE DIAM. IN INCHES
15
5
GAMMA RAY
API UNITS
150
0
GR
CALIPER


1.7
1.2
.7
0000
0100
0200
Casing
ρ BULK
Δρ
300
150
GR
CALIPER


0300
0400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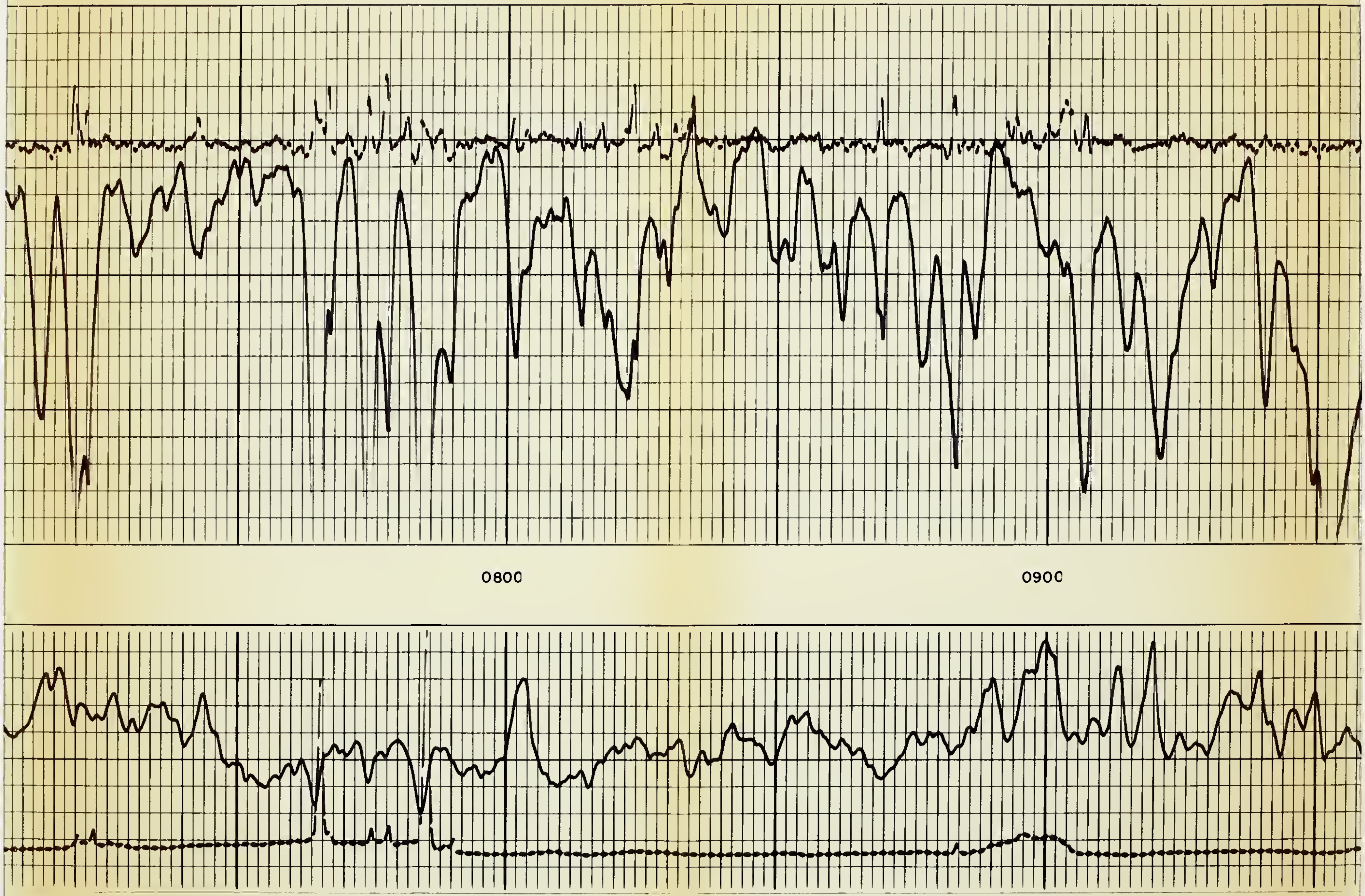
0600
0700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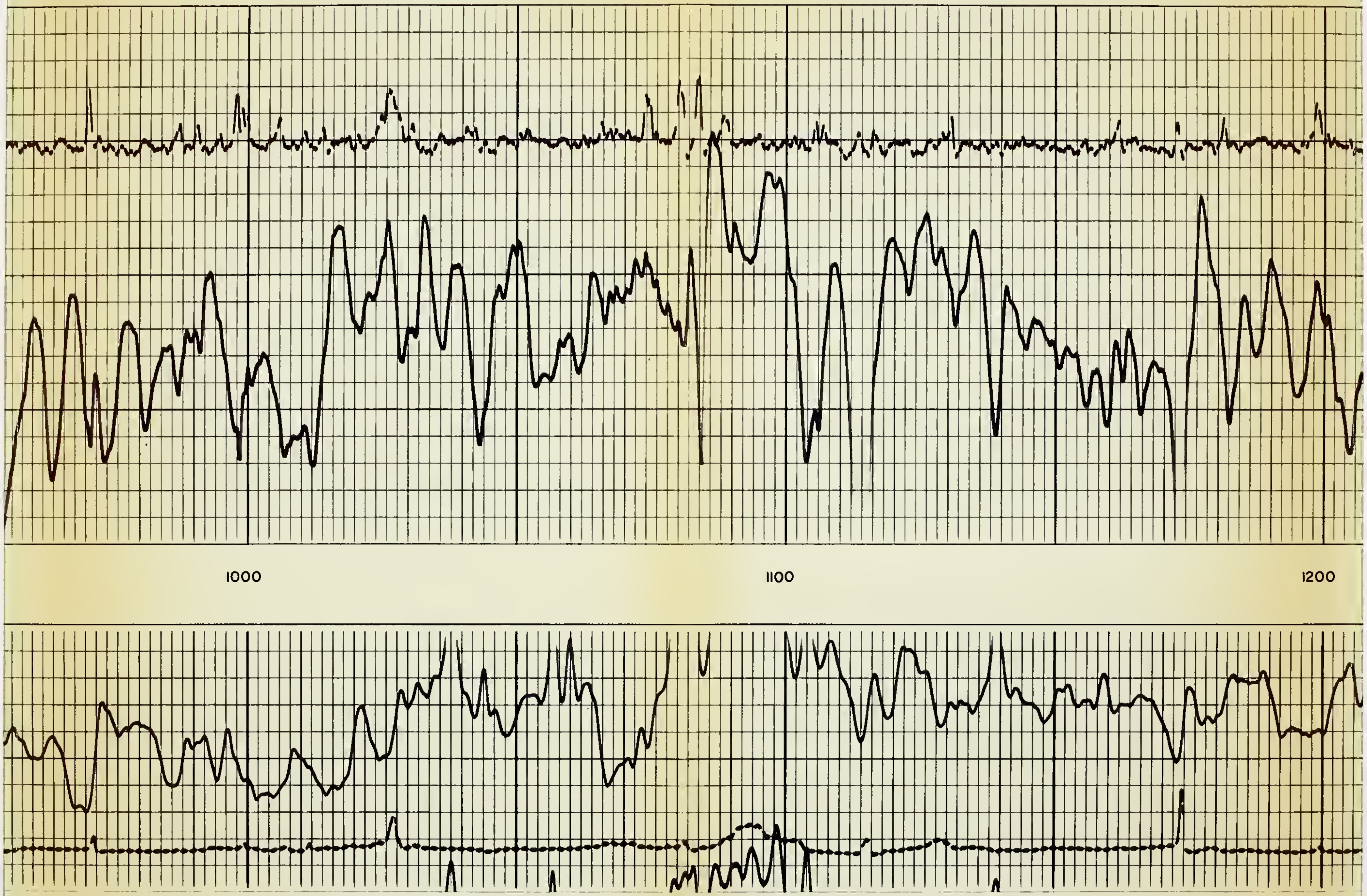
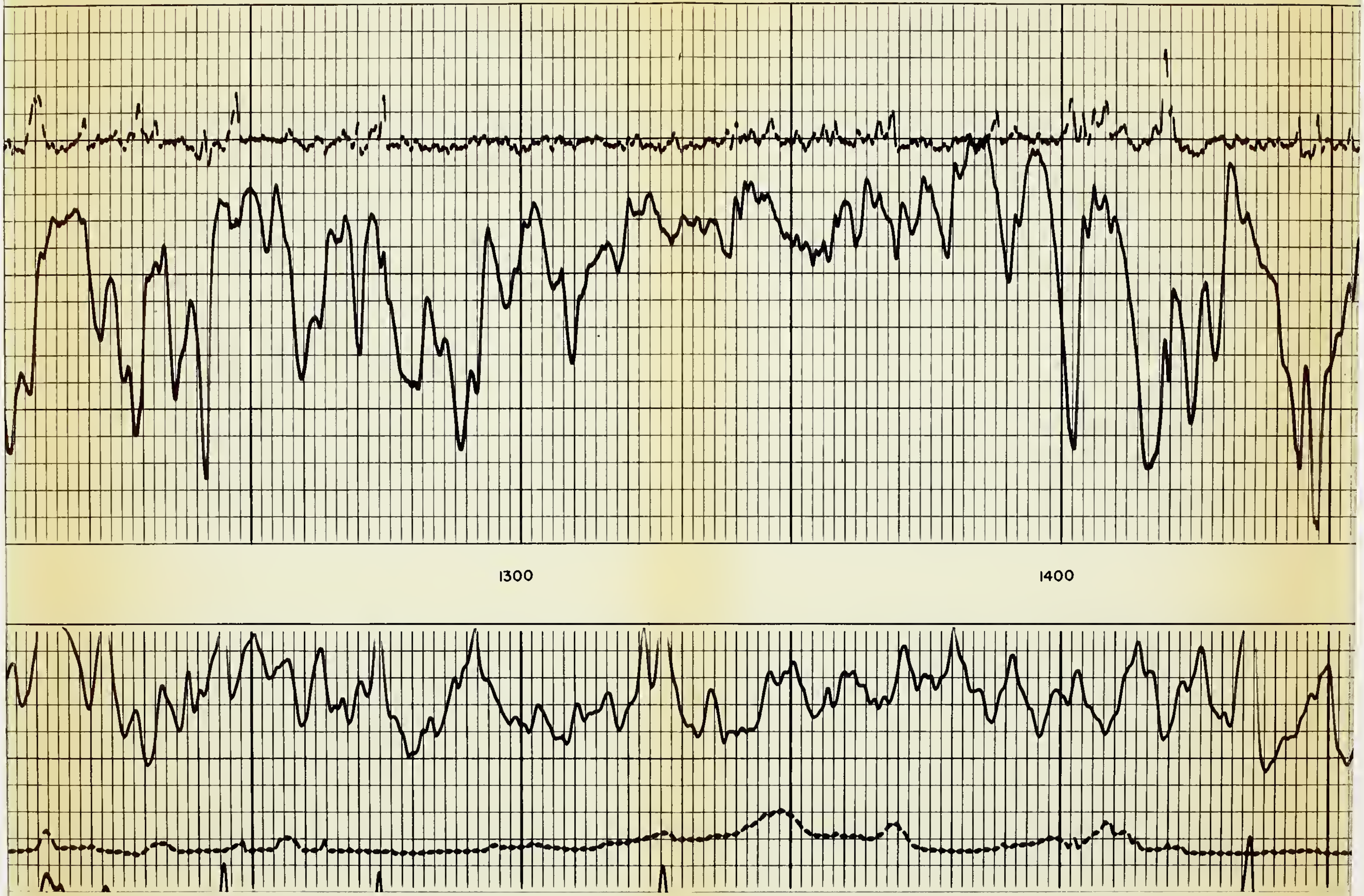
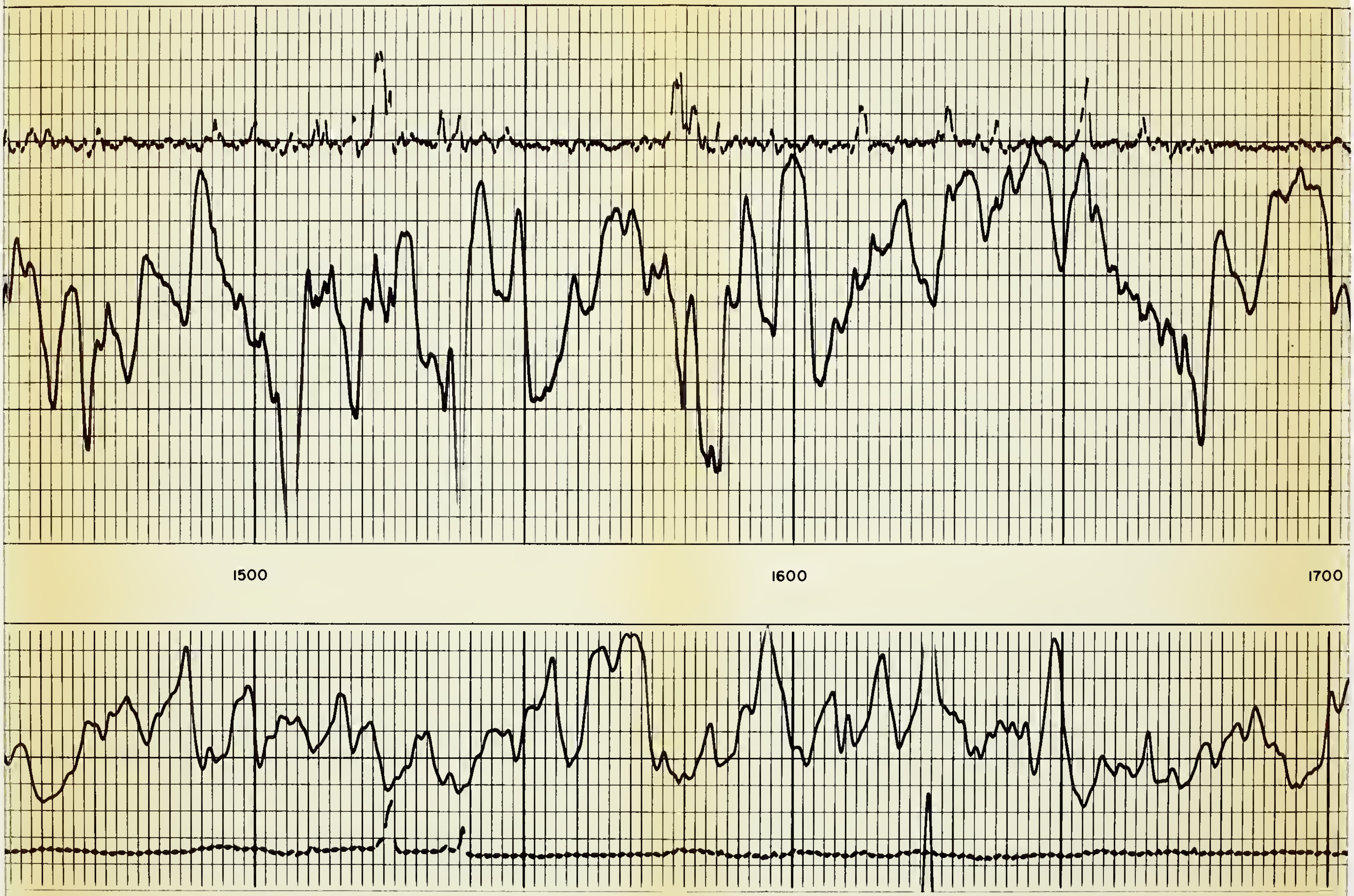
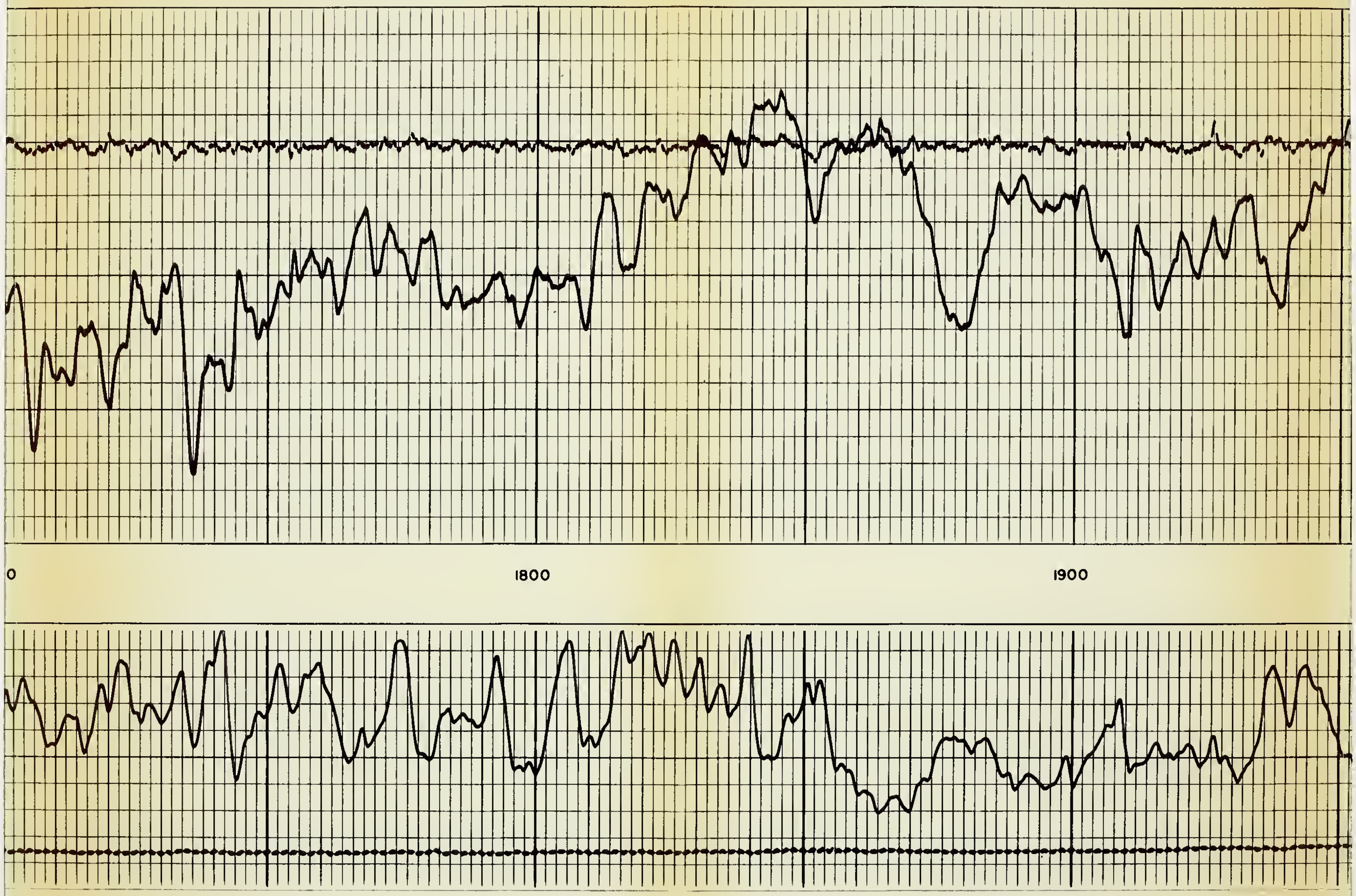
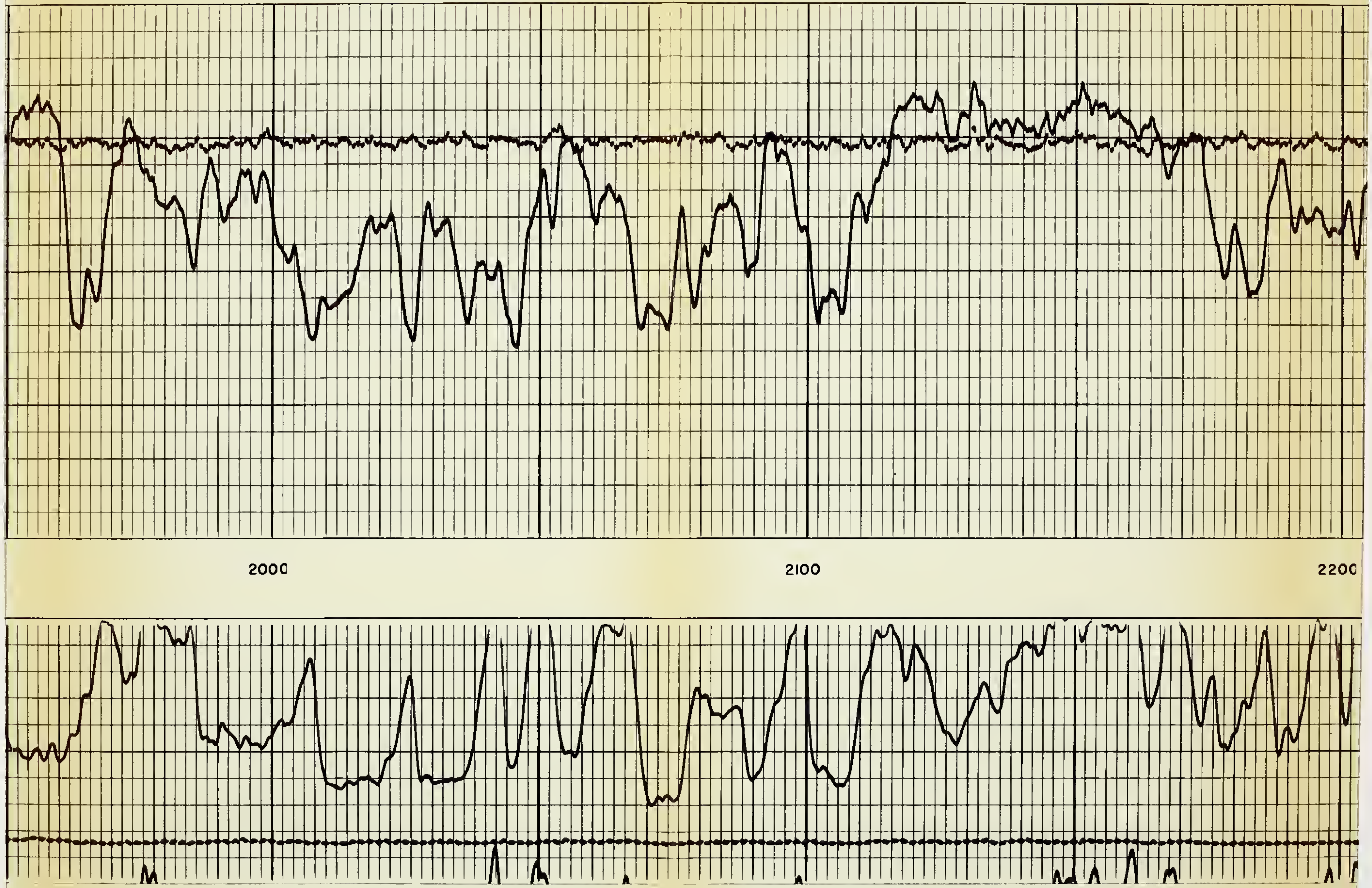
0900


1000
1100
1200


1300
1400


1500
1600
1700


0
1800
1900


2000
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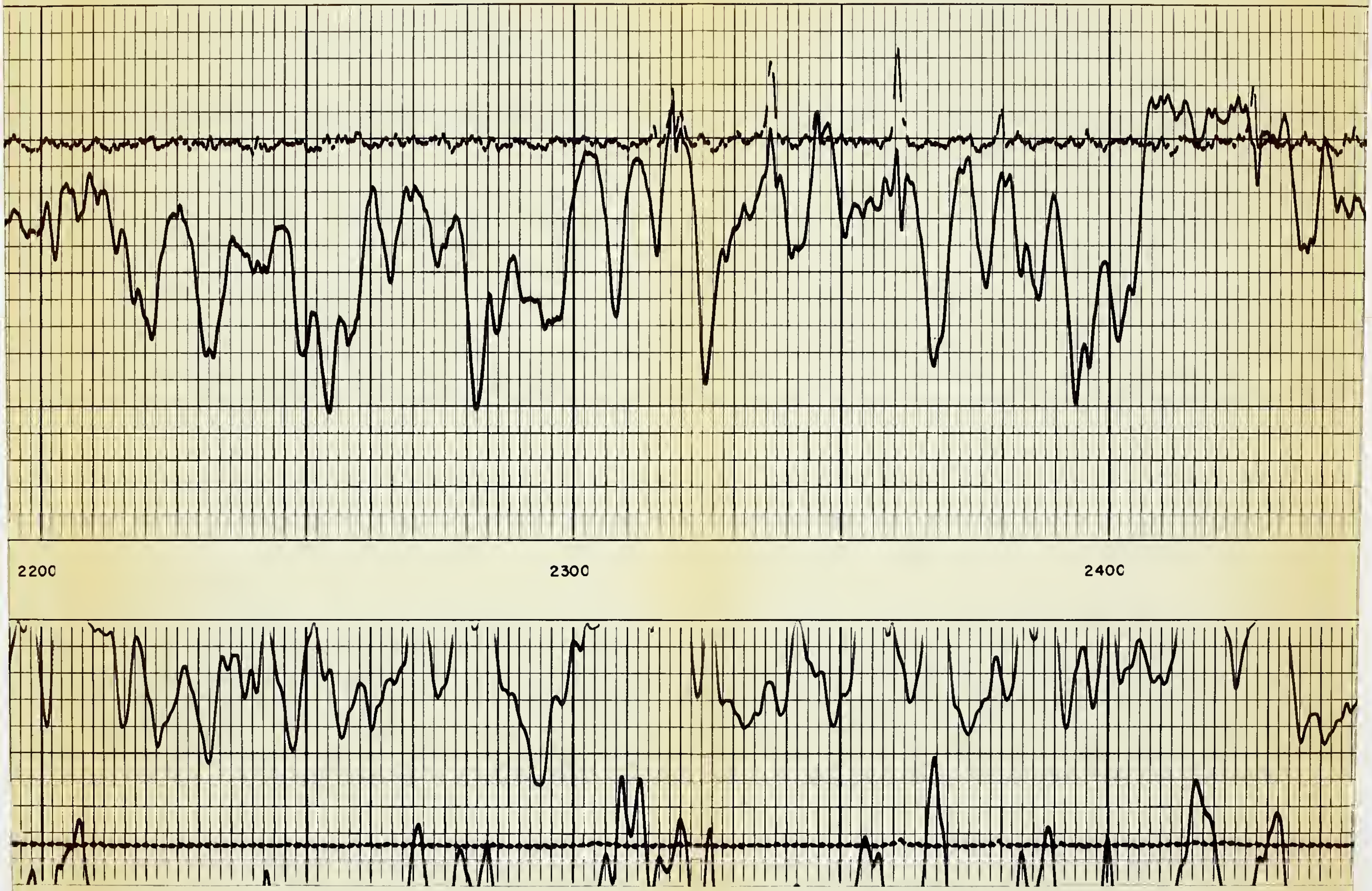
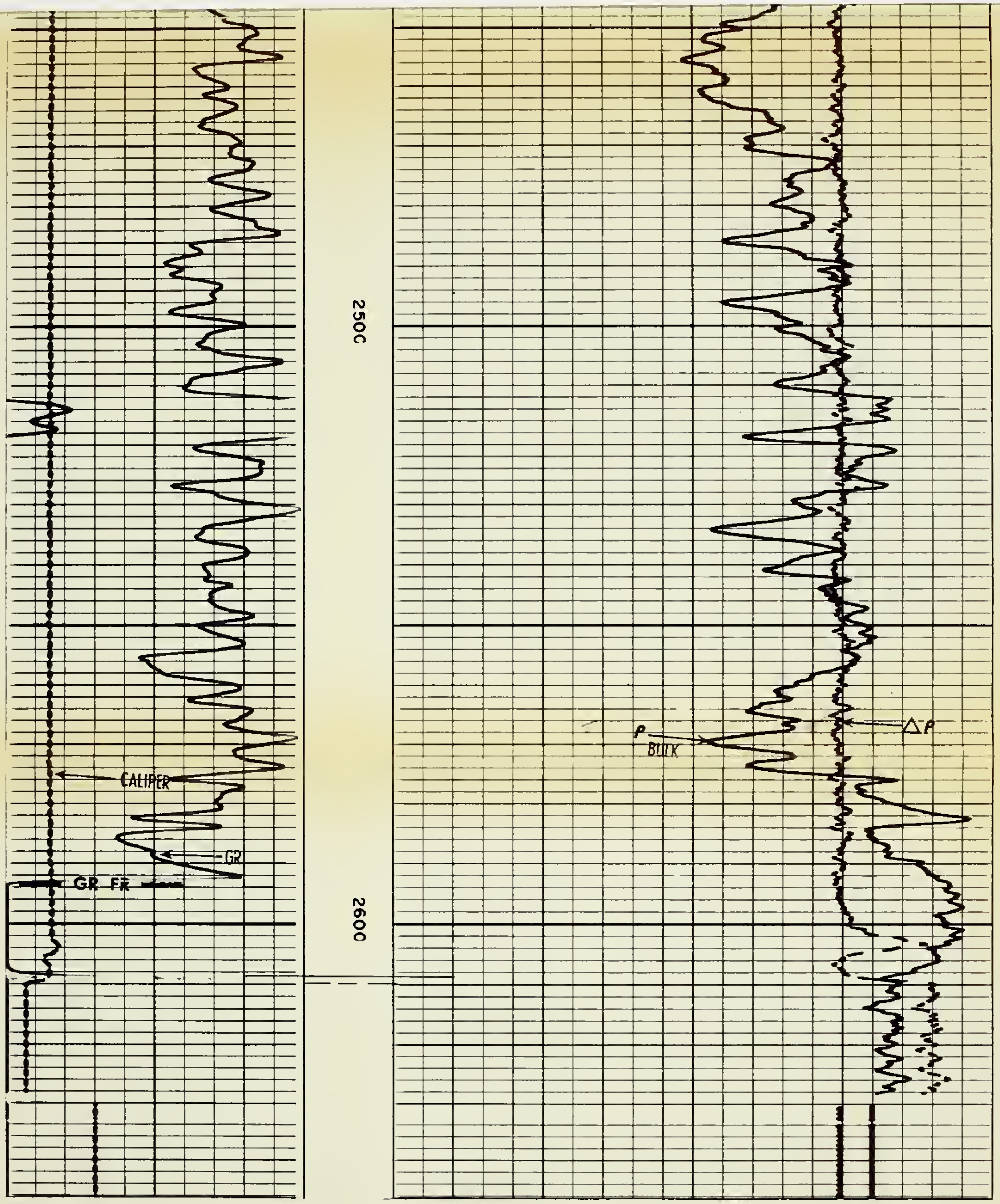
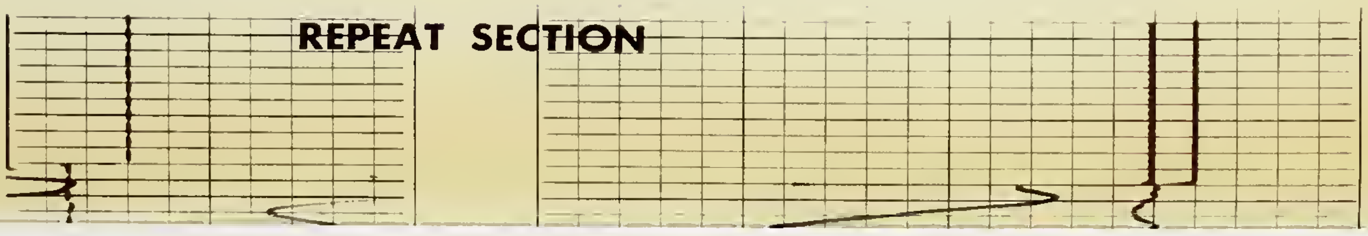
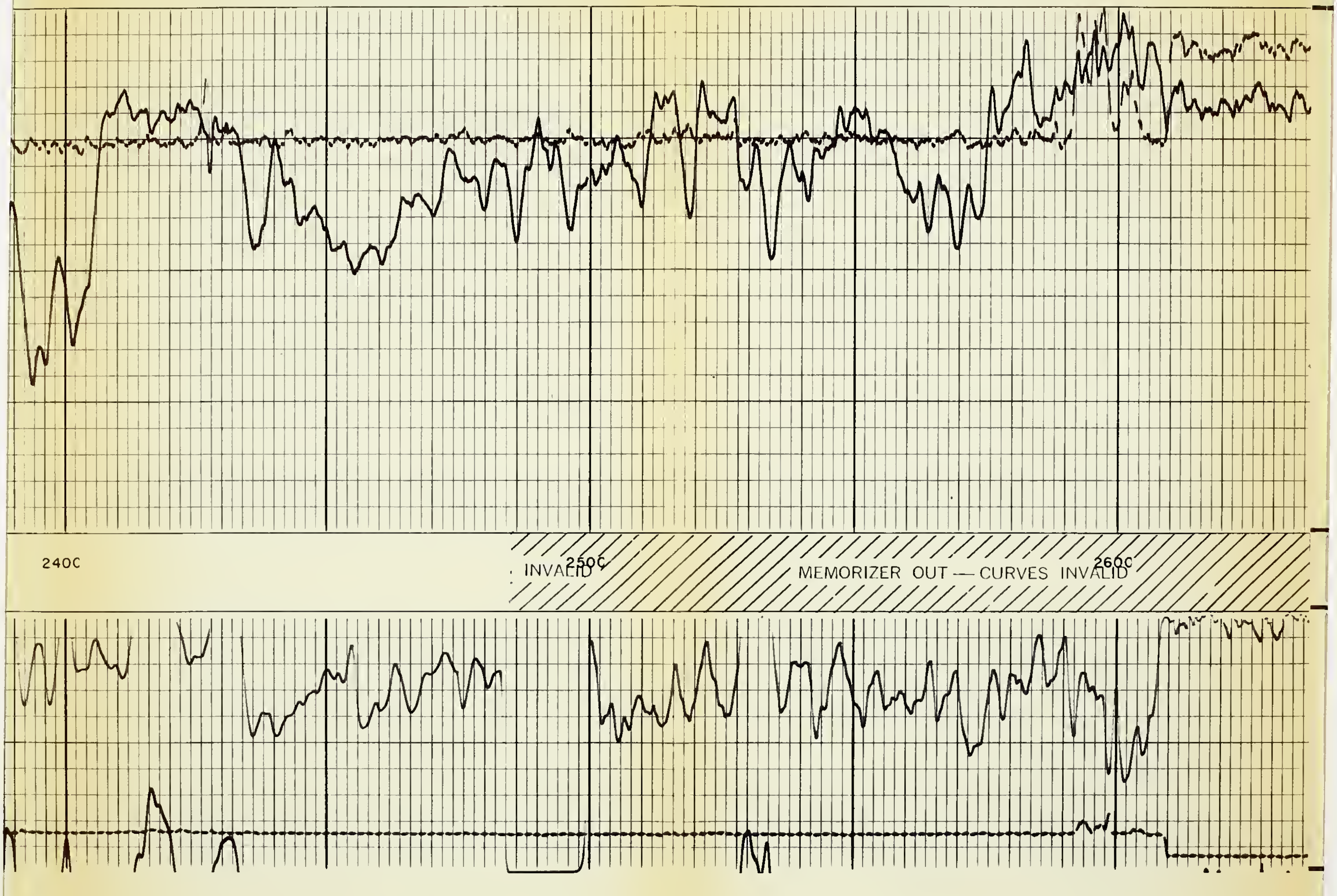
2200


2200
2300
2400




REPEAT SECTION


240C
INVALID
250C
MEMORIZER OUT — CURVES INVALID
260C

0 150

150 300

GAMMA RAY
API UNITS

5 15

CALIPER
HOLE DIAM. IN INCHES

DEPTHS

1.7 2.2 2.7

.7 1.2 1.7

BULK DENSITY
GRAMS/CC.

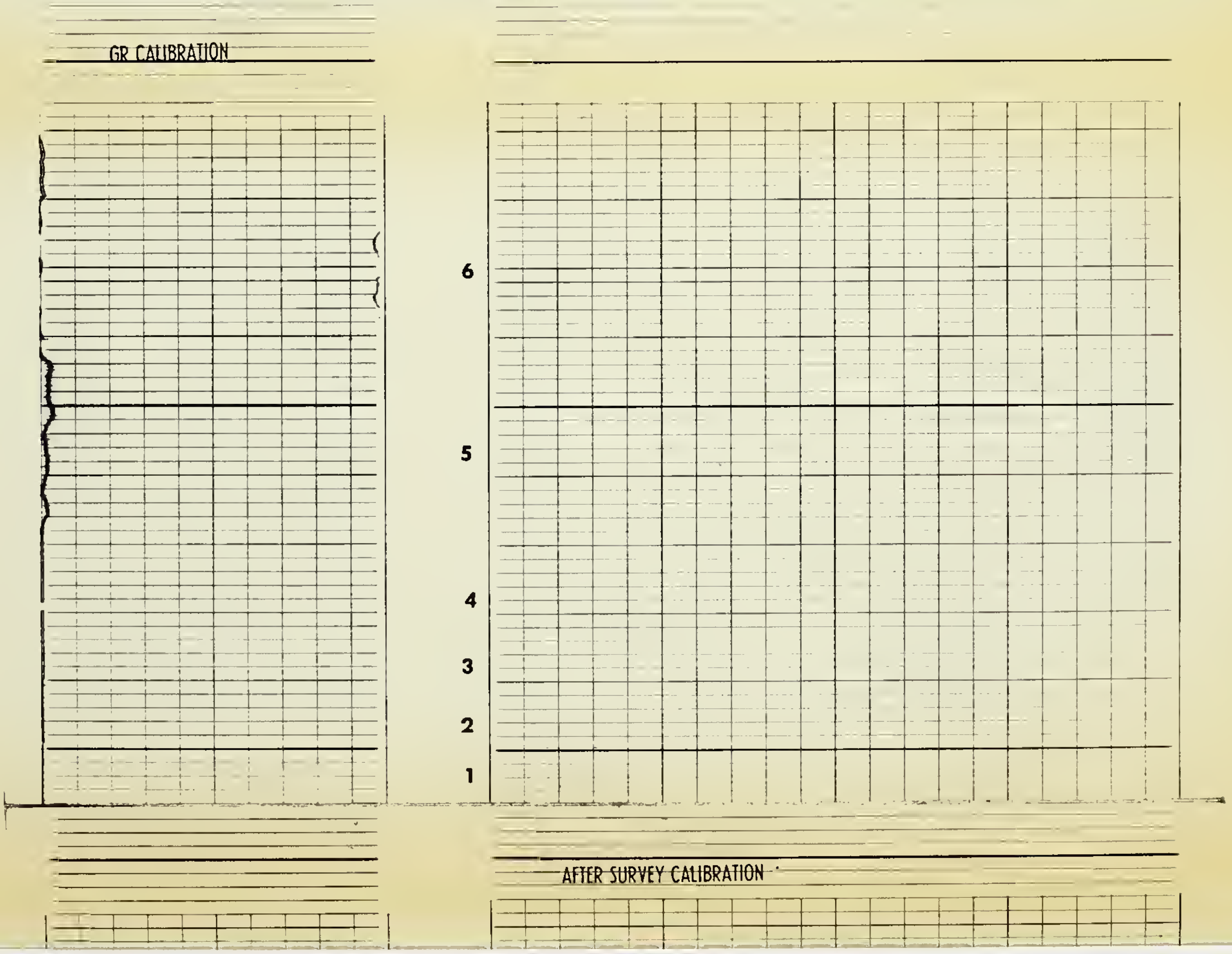
−.25 0 +.25

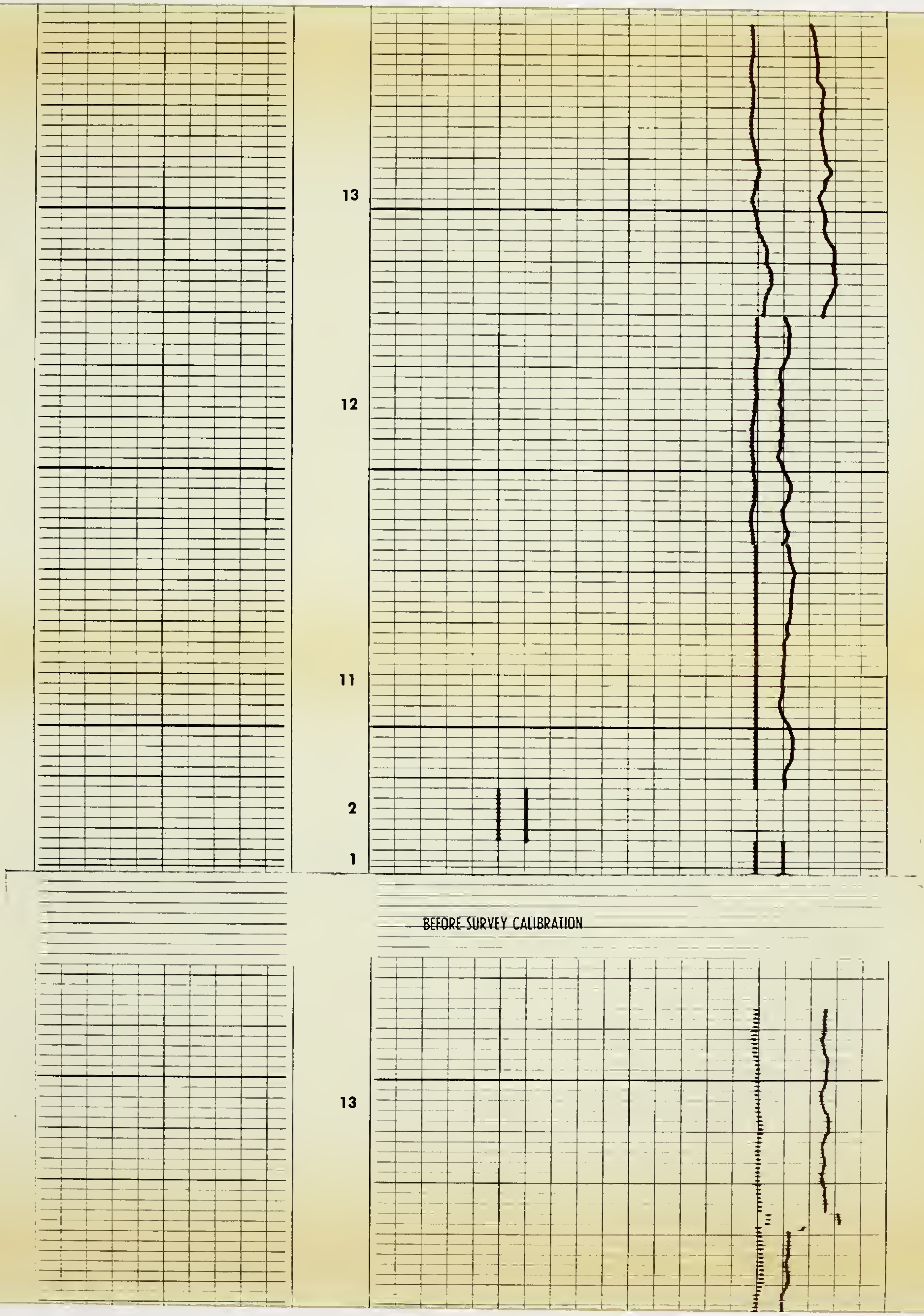
CORRECTION
GRAMS/CC.

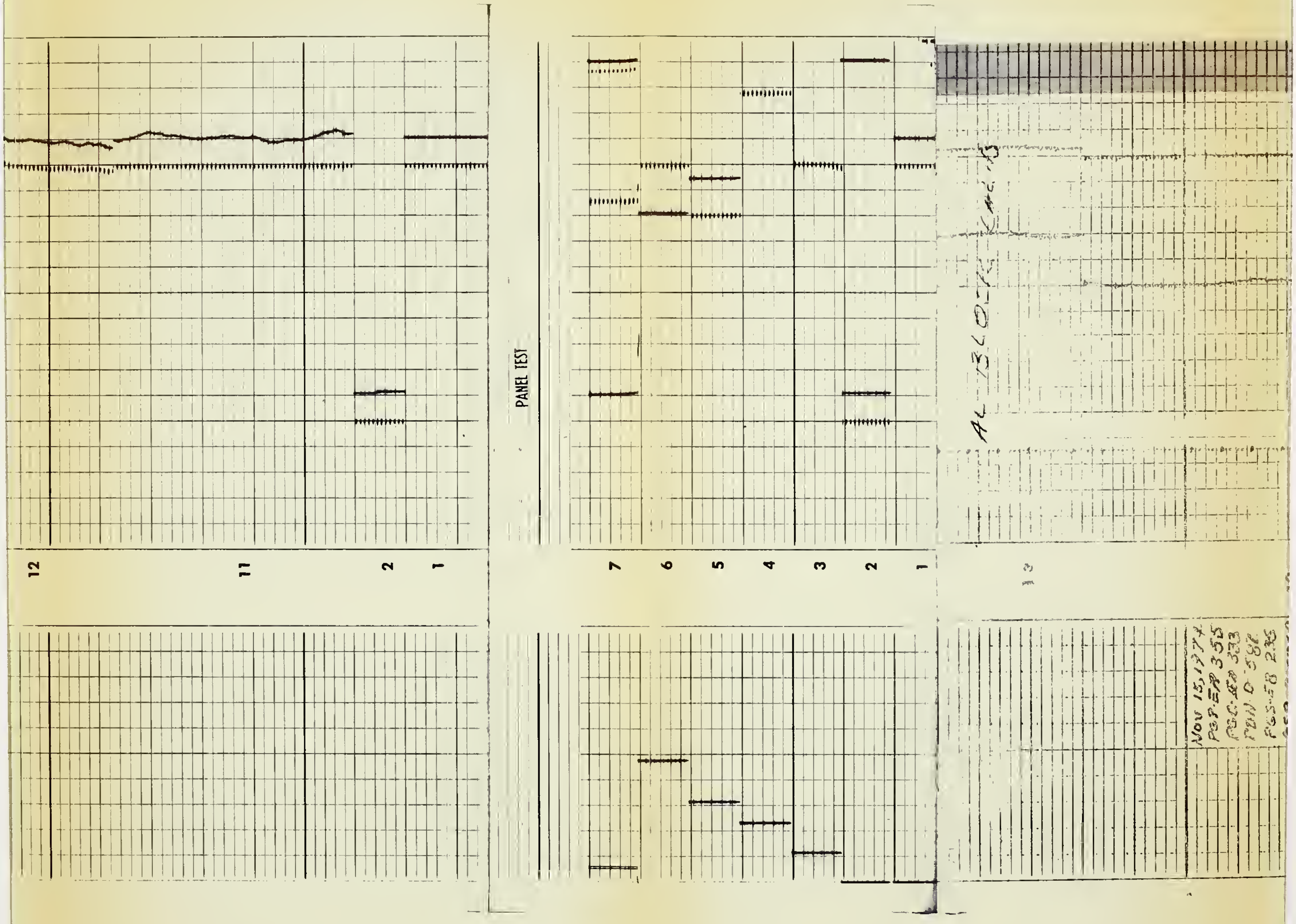
COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #8
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

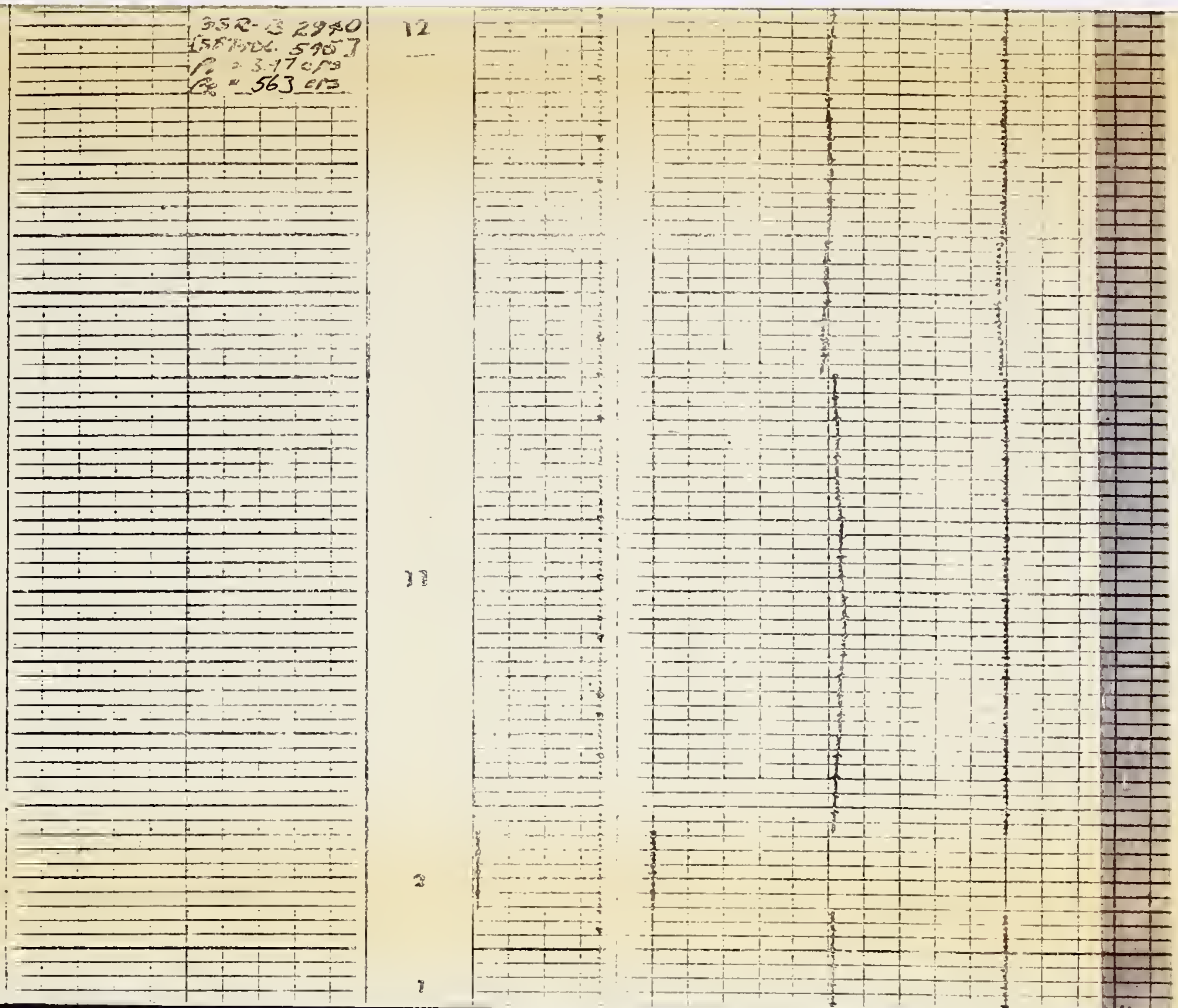
SCHL. FR 2609
SCHL. TD 2610
DRLR TD 2608
Elev:
KB ----
DF 6542
GL 6538

CALIBRATION RECORD




13
12
11
2
1
BEFORE SURVEY CALIBRATION
13


12
11
2
1
PANEL TEST
7
6
5
4
3
2
1
AL BLOCK Cards
Nov 15, 1974
P3P.EP 355
PGC.EP 333
PBN D 586
PGS.EB 285



FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST

FDC LIQUID

	POS	ρ	$\Delta\rho$
3.	# 1	2.92	.00
4.	# 2	2.78	+.14
5.	# 3	2.42	−.10
6.	# 4	2.35	.00
7.	# 5	2.08	.01

8. MECHANICAL ZERO CALIPER
9. 8" RING
10. 12" RING
11. TOOL CALIBRATE #1 SET $\rho = 2.50$
12. TOOL CALIBRATE #2 SET $\Delta\rho = .00$
13. LOG POSITION $\rho = 2.59$, $\Delta\rho = .015$

▲

CALIBRATION RECORD

COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #8
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2609
SCHL. TD 2610
DRLR TD 2608
Elev:
KB ----
DF 6542
GL 6538

CHAMPION CLASP No K-93
[illegible] 12½